# Chemical Week

February 22, 1958

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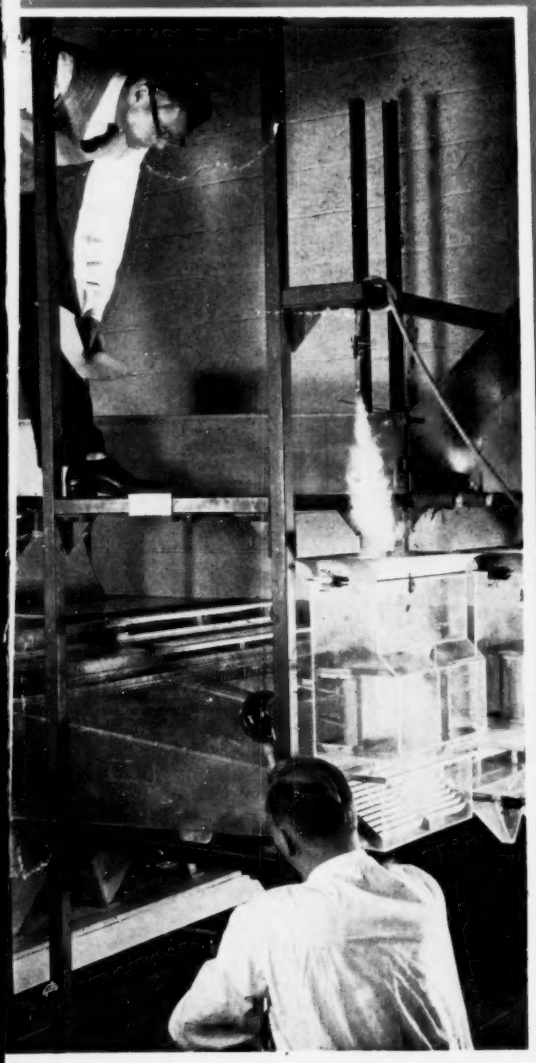

**How hard is recession hitting?**—question put to CPI experts at tape-recorded session . . . p. 30

**Chemicals against crime**—police buy nearly $1 million worth of specialties each year . . . . p. 50

**See-through models** show precipitator purchasers how to save $40-80,000 per installation . p. 74

**Natural salt cake lengthens lead** over Mannheim material in latest production tally . . . . . p. 97

**New products are the payoff;** three new ideas on how to shorten the odds . . . . . p. 103

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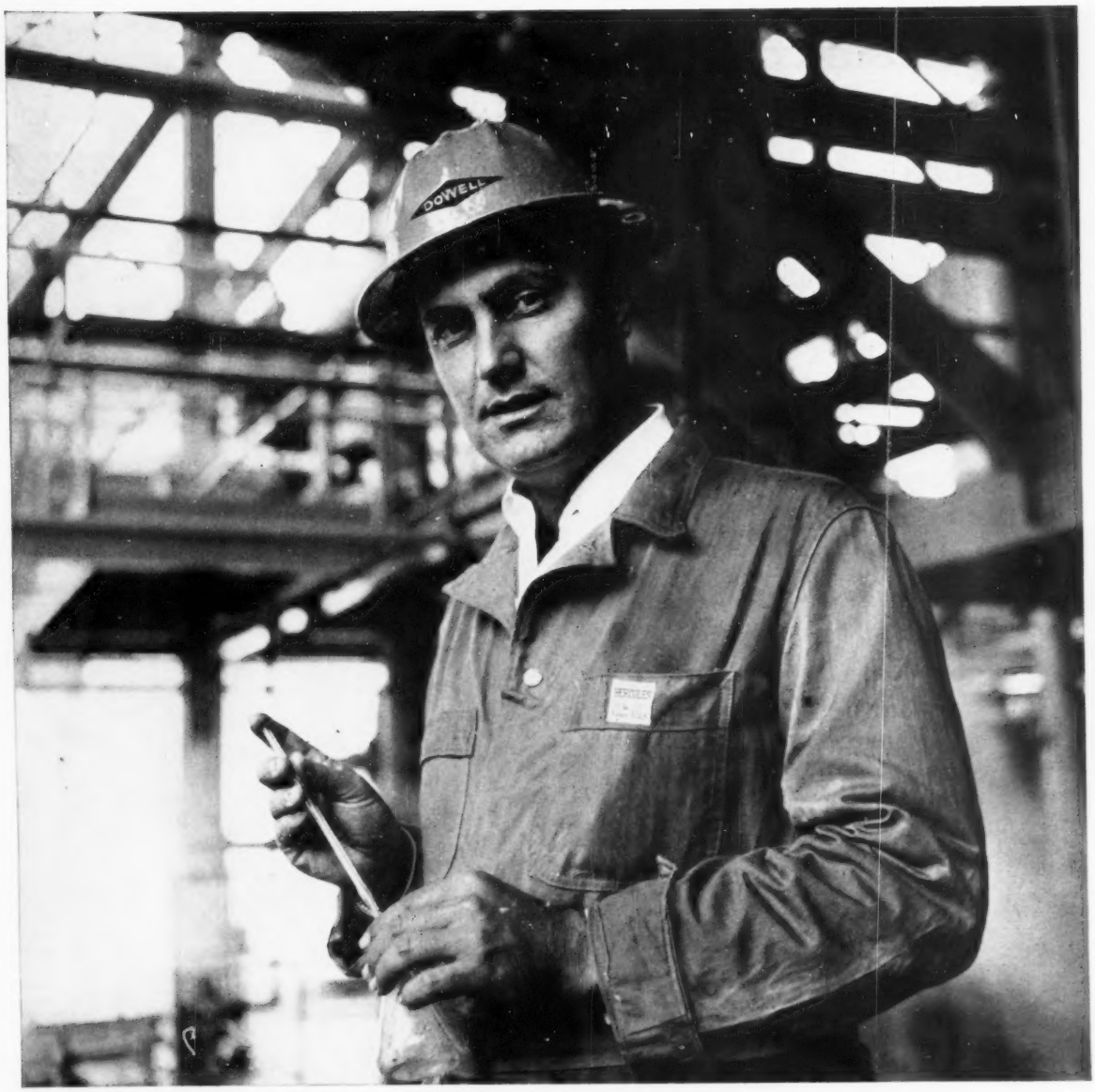


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Chemical Week

**TOP OF THE WEEK** **February 22, 1958**


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▶ **Low-cost acetylated starch derivatives** bid for new jobs in paper, textile, leather manufacturing ..... **p. 49**

▶ **Thioban launched as chemotherapeutant for TB,** but it's just one of a raft of newcomers ..... **p. 61**

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**27 BUSINESS NEWSLETTER**

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**32** Incentives, patent policy, secrecy rules draw industry criticism in hearings on U.S. atomic energy program.

**32** SOCMA hears Eisenhower aide argue for liberal trade-tariff law.

**33** Tranquilizer producers get clean bill of health from medical men in first round of Congressional hearing.

**33** Baltimore-based industry hails mayor's about-face; taxes on machinery, inventory and advertising expected to be called off soon.

Olin Mathieson and Thiokol executives tell how they see chemical companies' opportunities and responsibilities in missile field.

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Grace is doubling urea synthesis, will incorporate modifications and know-how that solved tricky Pechiney process problems.

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Acetylated starches are now cheap enough to challenge other starch derivatives in paper coating and sizing applications.

**50** Chemicals used in police work add up to a tidy business. Here's how the nation's police forces buy their materials.

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Drop in by-product sodium sulfate plus increasing output of natural material highlights a changing supply pattern.

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**No. 8**

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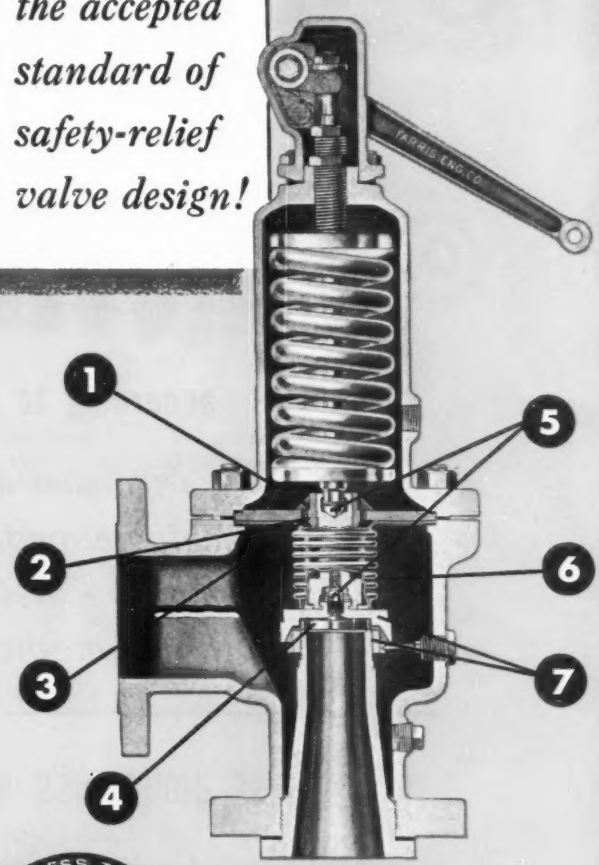


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## how these chemical process industries

# profit with a branch plant in Iowa

**according to an independent research firm***

*Adhesive and laminating compounds*
*Chemical intermediates • Coating and bonding resins*
*Fine Chemicals • Metallo-organic compounds • Surfactants*
*Synthetic medicinals and biological products*

---

## HOW THESE INDUSTRIES WERE DETERMINED

The chemical process industries were found to have outstanding profit possibilities with an Iowa location. An analysis of the following factors supports this conclusion: proximity to markets, raw materials, basic and parts supplies; operating costs, wage and freight rates; quality, aptitude and supply of labor; transportation and utilities; tax structures and government attitudes.

The Iowa Development Commission has compiled a concise survey of statistics and research findings to assist potential industries in evaluating their profit possibilities in Iowa. This current information is now available to industrial executives considering new plant locations now or in the future.

*Fantus Area Research, Inc.

# A BIG MARKET GETTING BIGGER

### Industrial chemicals

Iowa and the six states on her borders purchase $210 million worth of organic chemicals. Yet large segments of this market are now being supplied by firms outside the area. Iowa's central location would give a chemical processor in Iowa decided competitive advantages in supplying industrial users in Chicago-Milwaukee, Minneapolis-St. Paul, Omaha-Denver, St. Louis and Kansas City.

Indications point to an even greater chemical market in the near future. The paper industry, packaging and rubber processing, for example, are growing at a rapid rate.

### Agricultural chemicals

The extensive use of chemical fertilizers, insecticides, weed control chemicals and commercial applications of antibiotics, surface active agents and amino acids in agriculture and animal nutrition has created an important market. Iowa, as the leading farm state in the nation and as the center of the nation's richest agricultural region, is a natural location for processors of these chemicals.

With the trend in Iowa toward larger but fewer farms and the necessary mechanization required to run them, this market will become even more important in the next few years.

# BETTER SERVICE, LOWER OPERATING COSTS

Present suppliers of these organic chemicals would realize excellent sales potential in this highly diversified market without the expense and handicaps of remote distribution and service. In-bound and outbound shipping costs would be lowered. Due to a lack of concentration of employment in organic chemicals in Iowa, these industries would realize a more favorable wage pattern compared to present centers of production.

# NEARBY SOURCES OF RAW MATERIALS

Producing points of raw materials needed by these chemical process industries are located within economical distances from Iowa. In many cases, sources are close enough to make overnight truck shipments. This reduces time in transit and allows for smaller inventories of valuable materials. Sources of basic raw materials for organics processing are better than average in Iowa because of the state's strong position in chemurgy.

# ECONOMICAL TRANSPORTATION

Iowa's excellent transportation network offers chemical process industries efficient, economical shipments. Iowa is served by 11 railroads, her 8,500 miles of track rank her fourth in the nation for rail mileage. The Mississippi and Missouri waterways on Iowa's east and west borders provide low-cost barge transportation of bulk chemicals. The transportation gateways at Iowa's river-crossing points enable chemical processors to ship east and west at most favorable rates.

# QUALITY LABOR

Iowa's labor force, 95% native born white, is exceptionally well educated and stable. The percentage of high school graduates is unusually high — 38.5%. Their stability is indicated by the low average unemployment compensation rate paid by Iowa industries in 1955 — 0.8%, fifth lowest in the nation.

# ABUNDANT WATER AND ELECTRIC POWER

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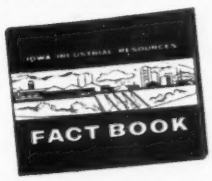

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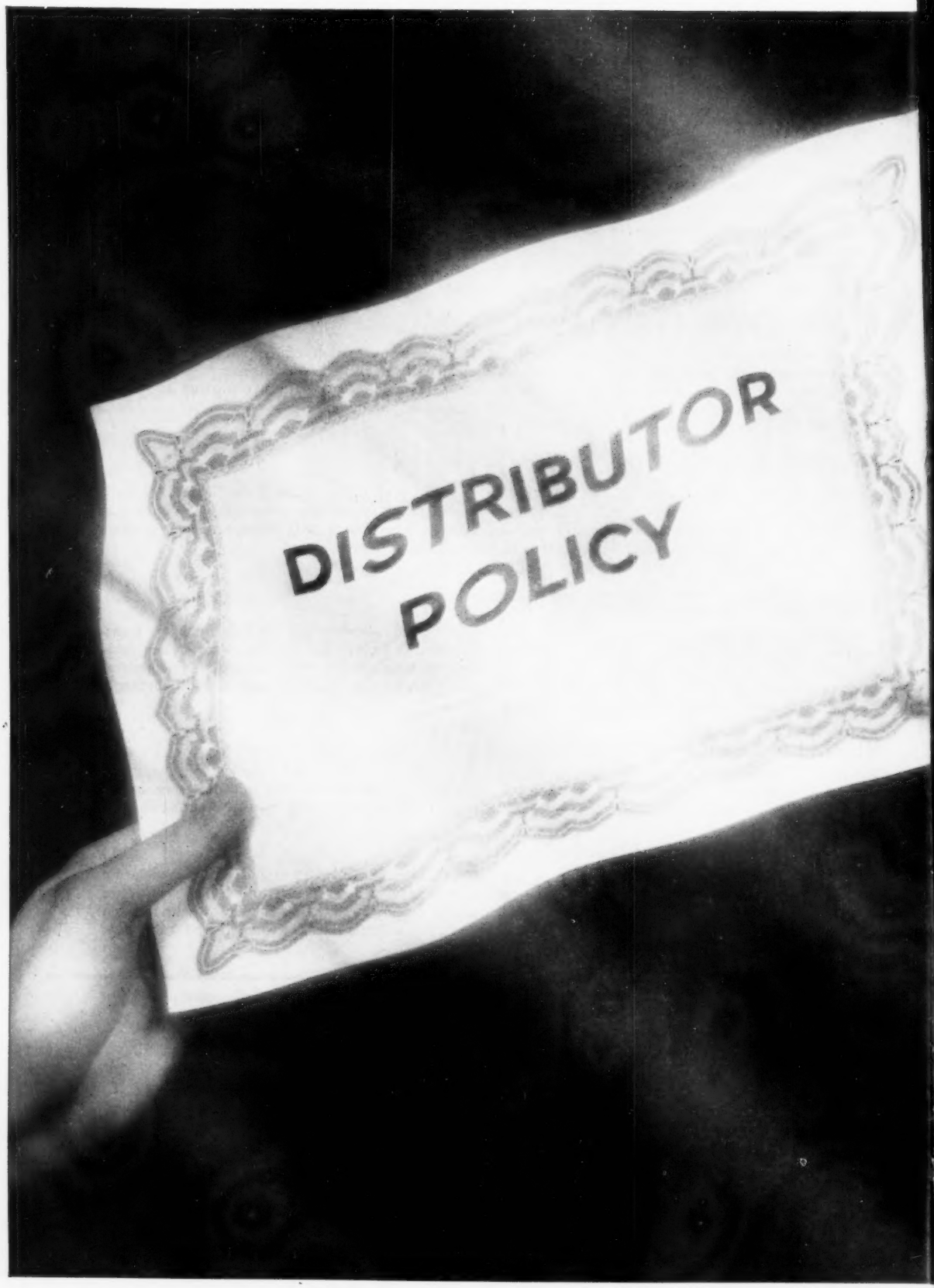
396 Jewett Building
Des Moines 9, Iowa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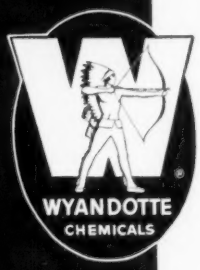
POLICY

ONE OF A SERIES

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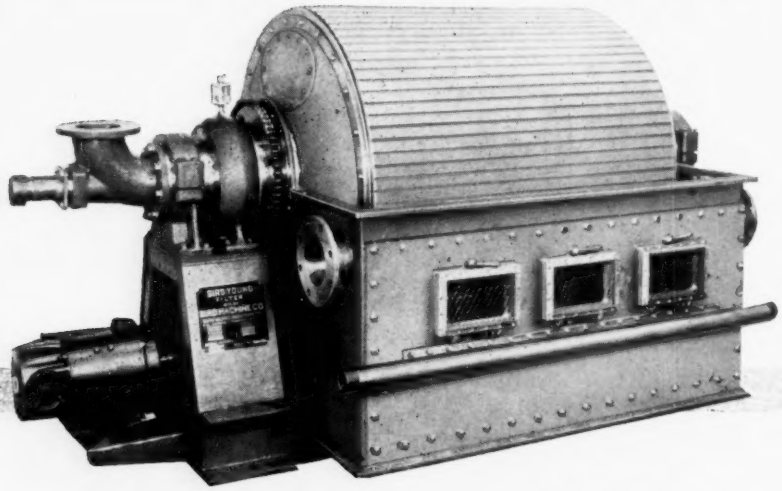

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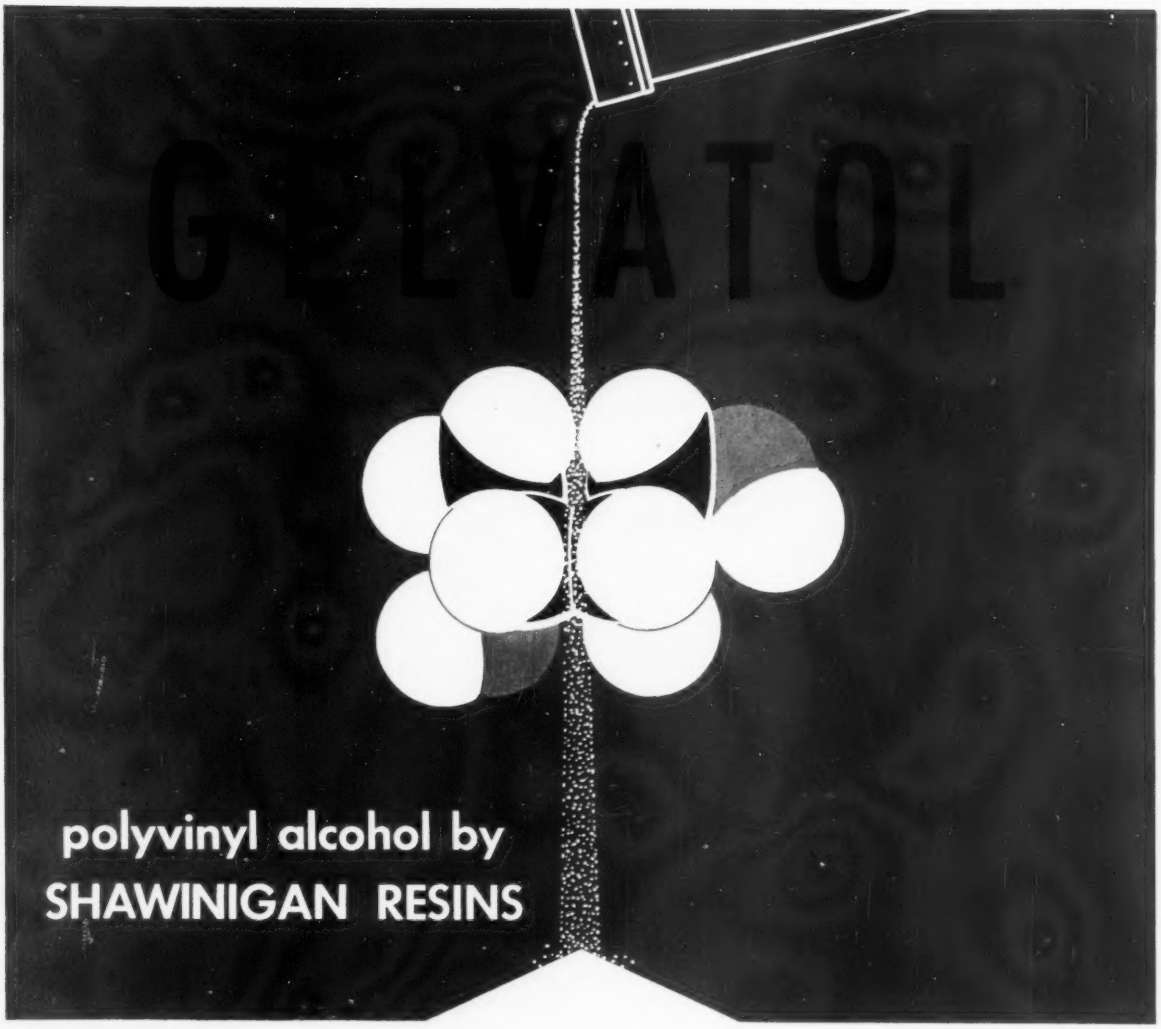


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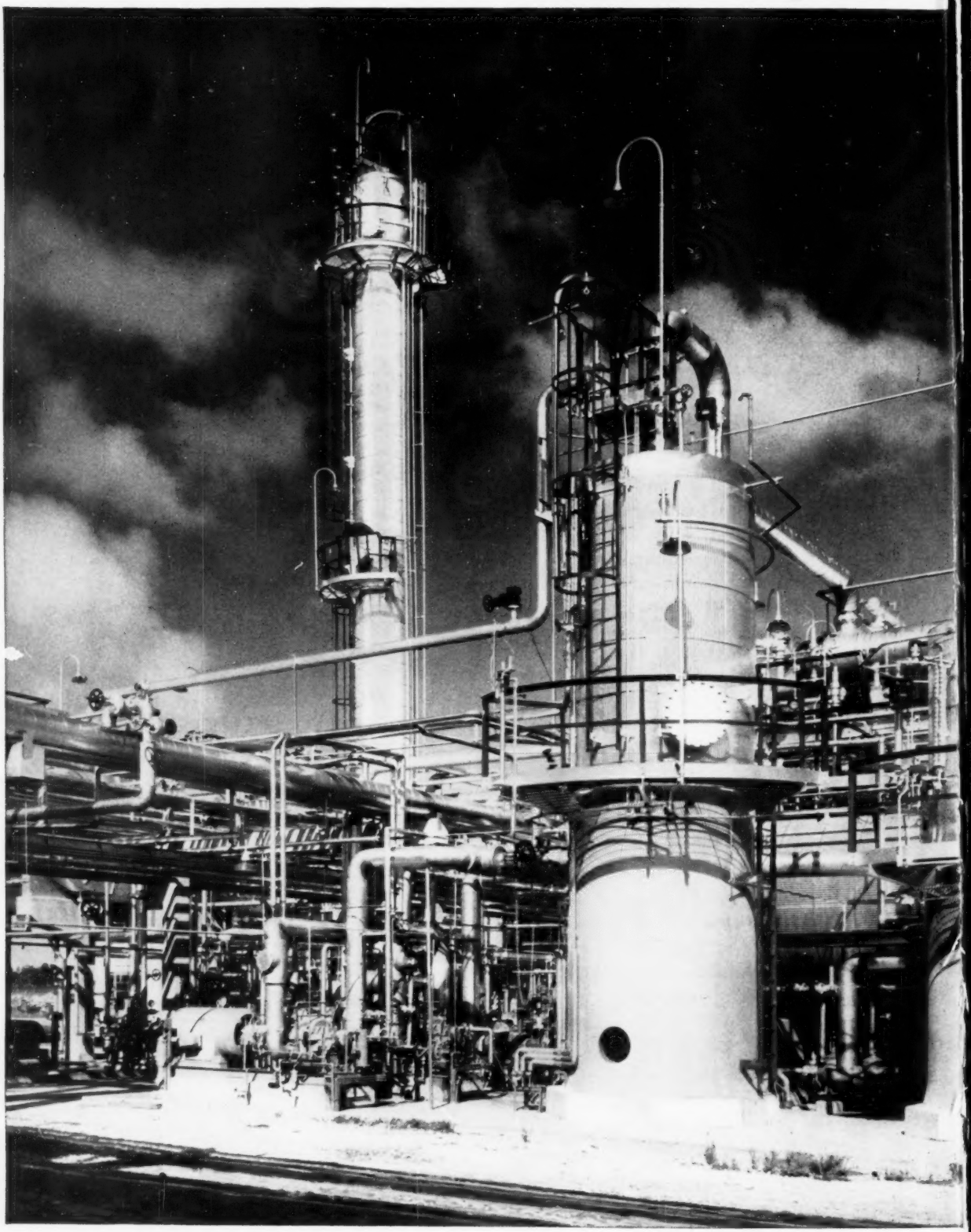
| Buffalo | Chemical Sales Corp. |
| Hicksville, Long Island | National Oil & Supply Co. |
| New York | Merchants Chemical Co., Inc. |
| **NORTH CAROLINA** | |
| Charlotte | F. H. Ross & Co. |
| Greensboro | F. H. Ross & Co. |
| Raleigh | F. H. Ross & Co. |
| **OHIO** | |
| Cincinnati | Merchants Chemical Co., Inc |
| Cleveland | Ohio Solvents & Chemicals Co. |
| Columbus | Merchants Chemical Co., Inc. |
| **OREGON** | |
| Portland | Van Waters & Rogers, Inc. |
| **PENNSYLVANIA** | |
| Altoona | Western Penna. Chemical Co., Inc. |
| Erie | Western Penna. Chemical Co., Inc. |
| Middletown (Harrisburg) | Western Penna. Chemical Co., Inc. |
| Philadelphia | Pioneer Salt Co. |
| **RHODE ISLAND** | |
| Providence | Borden & Remington Co. |
| Providence | George Mann & Co., Inc. |
| **SOUTH CAROLINA** | |
| Columbia | F. H. Ross & Co. |
| Greenville | F. H. Ross & Co. |
| **TENNESSEE** | |
| Chattanooga | Burkart-Schier Chemical Co. |
| Knoxville | Burkart-Schier Chemical Co. |
| Knoxville | F. H. Ross & Co. |
| Nashville | Burkart-Schier Chemical Co. |
| **TEXAS** | |
| Dallas | Van Waters & Rogers, Inc. |
| Houston | Van Waters & Rogers, Inc. |
| **UTAH** | |
| Salt Lake City | Braun-Knecht-Heimann Co. |
| **WASHINGTON** | |
| Seattle | Van Waters & Rogers, Inc. |
| **WISCONSIN** | |
| Milwaukee | Merchants Chemical Co., Inc. |

**FOR "HEXALIN" & "HYTROL" O**

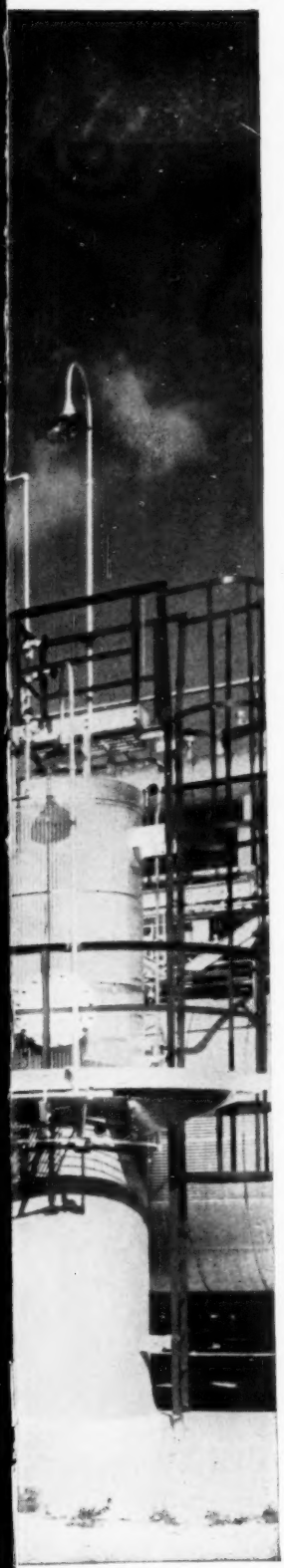
| | |
|---|---|
| **CALIFORNIA** | |
| Los Angeles | Braun Corporation |
| Los Angeles | Mefford Chemical Company |
| San Francisco | Braun-Knecht-Heimann Co. |
| **ILLINOIS** | |
| Chicago | Central Solvents & Chemicals Co. |
| **INDIANA** | |
| Fort Wayne | Hoosier Solvents & Chemicals Corp. |
| Indianapolis | Hoosier Solvents & Chemicals Corp. |
| **KENTUCKY** | |
| Louisville | Dixie Solvents & Chemicals Co. |
| **MASSACHUSETTS** | |
| Boston | Howe & French, Inc. |
| Worcester | Chemical Sales & Service Co., Inc. |
| **MICHIGAN** | |
| Detroit | Western Solvents & Chemicals Co. |
| **MISSOURI** | |
| Kansas City | Missouri Solvents & Chemicals Co. |
| St. Louis | Missouri Solvents & Chemicals Co. |
| **NEW JERSEY** | |
| Newark | C. P. Chemical Solvents, Inc. |
| **OHIO** | |
| Cincinnati | Amsco Solvents & Chemicals Co. |
| Cleveland | Ohio Solvents & Chemicals Co. |
| Toledo | Toledo Solvents & Chemicals Co. |
| **TEXAS** | |
| Dallas | Texas Solvents & Chemicals Co. |
| Houston | Texas Solvents & Chemicals Co. |
| **WISCONSIN** | |
| Milwaukee | Wisconsin Solvents & Chemicals Corp. |

*Reg. U. S. Pat. Off.

# W. R. Grace & Co.'s 50,000,000 pound



# high density polyethylene plant now in commercial production



* Multi-million dollar facility to produce GREX, the new high strength plastic resin.

* W. R. Grace & Co., Polymer Chemicals Division, reports GREX substantially improved over other resins, promising new horizons for plastics.

W. R. Grace & Co., Polymer Chemicals Division, recently put into commercial operation its multi-million dollar plant at Baton Rouge, Louisiana. First product is GREX, brand-new high density polyethylene. 50,000,000 pound annual capacity makes this the world's largest plant of its kind to come on stream as an integrated operating unit.

For several months, plastic fabricators have been testing and evaluating quantities of GREX with excellent results. Now, with this new plant, GREX is immediately available for large-scale commercial application.

### "NEW CHEMICAL PRODUCT"

Officials of W. R. Grace & Co. express enthusiasm over the possibilities GREX offers the plastics industry, characterizing GREX as "plastic of tomorrow" and "new concept in plastics." According to Mr. T. T. Miller, Polymer President, "GREX differs from other plastics to such a degree, it merits being called a new chemical product."

Exceptional toughness and resistance to extremes of heat and cold are the outstanding property improvements to be found in GREX. Resistance to chemicals, impermeability to moisture vapor, good electrical characteristics, and rigidity are other property areas in which GREX excels. This new material can be injection molded, extruded, compression molded, blow molded, calendered, vacuum formed and foamed. It can be machined, punched, drilled, welded and heat sealed.

### VERSATILITY CITED

What does this mean to the plastics industry? "GREX," explains Mr. Miller, "gives the fabricator a quality resin with outstanding versatility. GREX permits him to convert ideas for completely new plastic products into selling items. And by switching to GREX, he can upgrade his present plastic products.

The Polymer Chemicals Division laboratories at Clifton, N. J. include a full line of commercial size plastic fabrication equipment for development purposes. Here, a trained and seasoned technical staff works with Grace customers to learn what plastic products can be better-made with GREX, to uncover new uses for plastics, and to discover more efficient fabrication techniques. The Grace technical staff have also proved their ability to help a customer in his own plant.

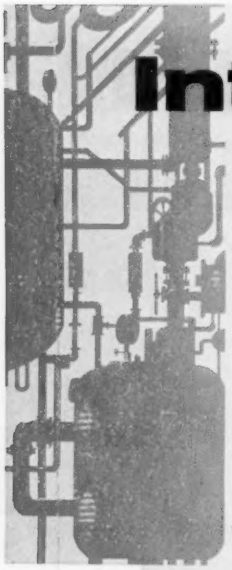
### OFFER MARKETING SUPPORT

The makers of GREX extend this support to the marketing of GREX products as well. Grace merchandising experts will work with fabricators, and through them, with customers, to help search out their most promising markets. Then, Grace will collaborate on sales and promotion planning to achieve increased sales.

Mr. Miller emphasizes that GREX is expected to make substantial gains in markets now dominated by other materials like glass, wood, metal, offering the plastics industry unlimited potential. There is virtually no business that cannot put GREX to good use.

### INQUIRIES INVITED

"GREX is a new product with great promise," he declares. "We believe in it to the tune of over $20 million. But more important, we at Grace are willing to work to prove out GREX in actual applications. Anyone interested in GREX has only to write or phone us at our Clifton offices—225 Allwood Road, Clifton, New Jersey, GRegory 2-6000. His inquiry will receive our immediate attention and he can be sure of full cooperation from our entire organization."



# Intermediates

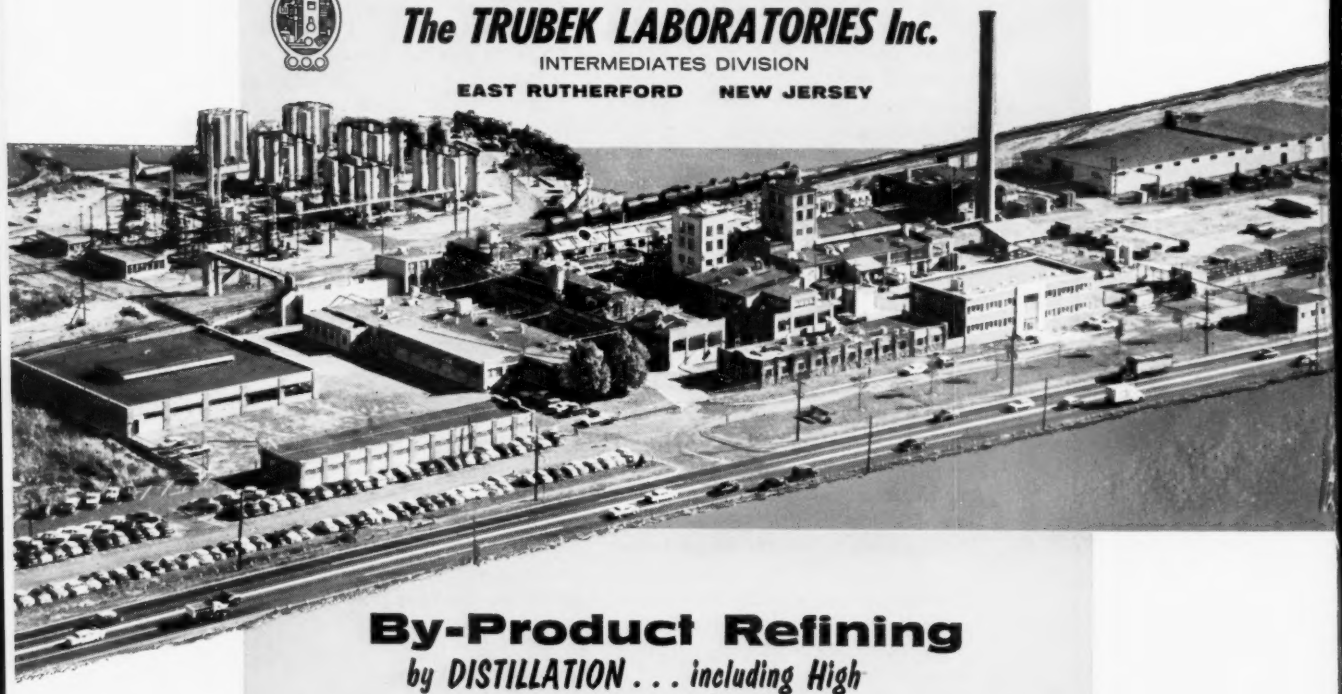
ACETALDEHYDE AMMONIA
ACETOPHENONE
ACETYL CHLORIDE
ANISIC ALDEHYDE
ANISYL ACETONE
ANISYL ALCOHOL TECH.
ANISYL CHLORIDE
ANISYL CYANIDE
BENZALACETOPHENONE
BENZHYDROL
BENZHYRYLAMINE
BENZHYDRYL CHLORIDE
BENZOPHENONE TECH.
BENZYL ALCOHOL TECH.
BENZYL CYANIDE
BUTYROYL CHLORIDE
n-CAPROIC ACID
CAPROYL CHLORIDE
CAPRYLOYL CHLORIDE
p-CHLORBENZHYDRYL CHLORIDE
CINNAMOYL CHLORIDE
DIBENZYL ETHER
DICYCLOHEXYL CARBINOL
DICYCLOHEXYL KETONE
p, p'-DIMETHOXYBENZOPHENONE
DIPHENYL ACETONE (unsym)
DIPHENYL METHANE
ETHYL FORMATE TECH.
ETHYL PHENYLACETATE
beta IONONE
ISOBUTYROYL CHLORIDE
ISOVALERIC ACID
LAUROYL CHLORIDE
p-METHOXY PHENYLACETIC ACID
METHYL HEPTENONE
METHYL PHENYLACETATE
MYRISTOYL CHLORIDE
PALMITOYL CHLORIDE
PHENYLACETIC ACID
PHENYLACETONE
PHENYLACETYL CHLORIDE
PHENYL PROPYL ALCOHOL
PHENYL PROPYL CHLORIDE
POTASSIUM PHENYLACETATE
PROPIONYL CHLORIDE
PROPIOPHENONE
SODIUM PHENYLACETATE
STEAROYL CHLORIDE
n-VALERIC ACID
And Other Intermediates

1932

## *The TRUBEK LABORATORIES Inc.*

INTERMEDIATES DIVISION

**EAST RUTHERFORD NEW JERSEY**



## By-Product Refining

### *by DISTILLATION . . . including High Temperature and High Vacuum . . .*

rendered on a toll basis — or by the outright purchase of the starting by-product.

The facilities and experience of Truland may be employed advantageously for the economical upgrading and disposal of solvent mixtures and organic by-products.

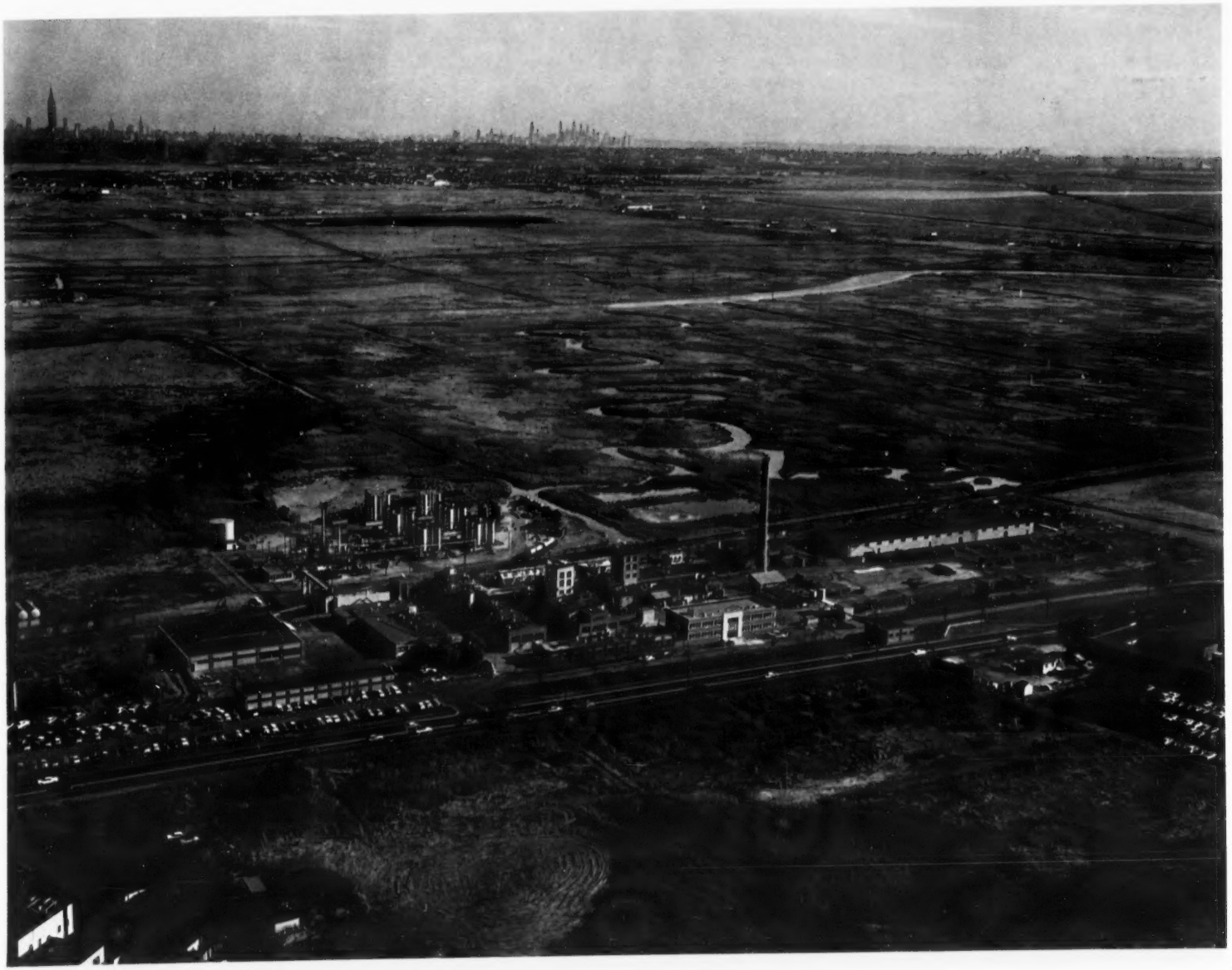
Our technically trained personnel are available to discuss the refining of any solvent mixture or organic by-product.

**TRULAND CHEMICAL CO., INC.**
EAST RUTHERFORD NEW JERSEY

TRULAND

Division of **THE TRUBEK LABORATORIES** Incorporated

**Send** *for new booklet which describes our operation*



THE TRUBEK LABORATORIES INCORPORATED

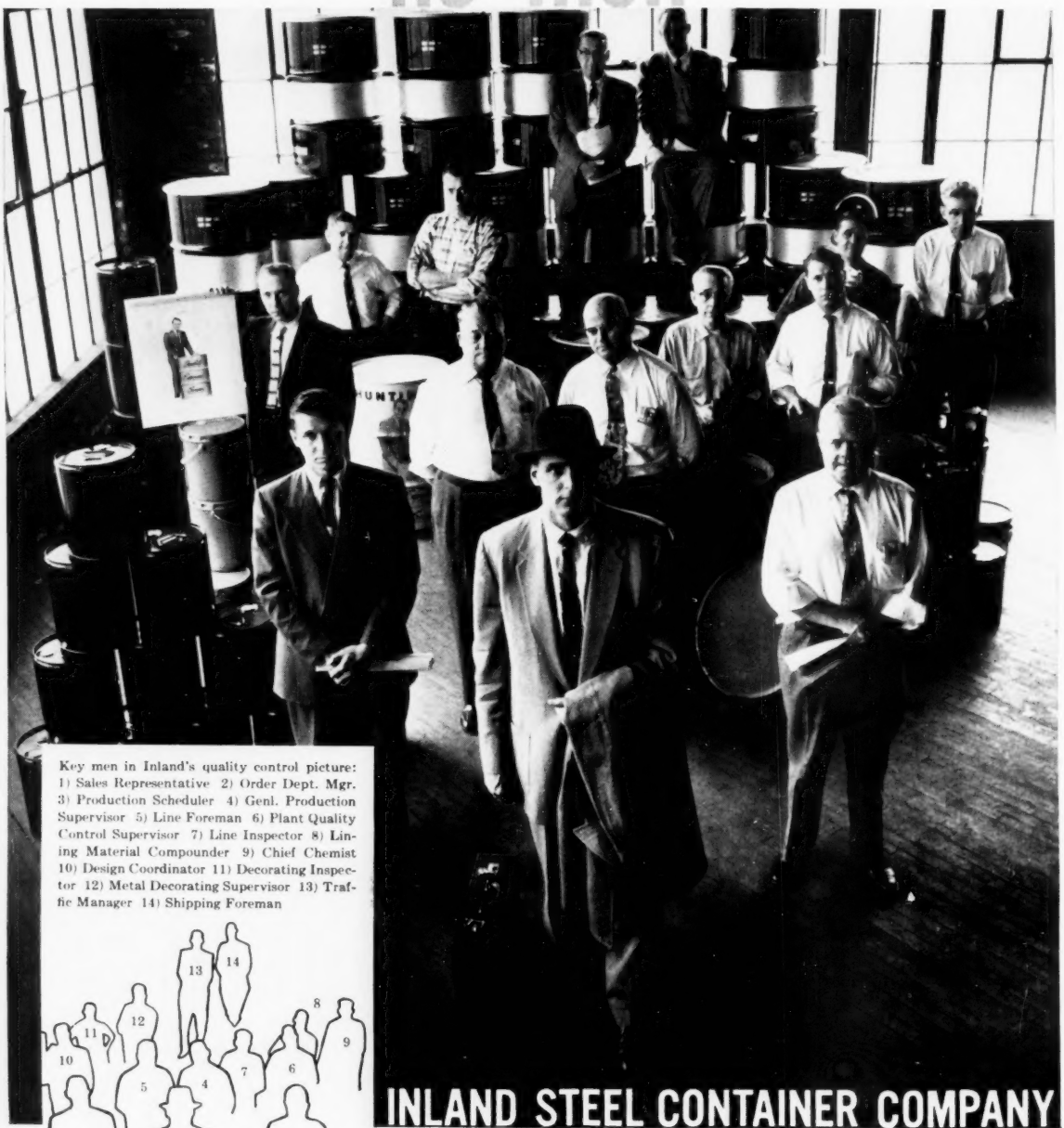
Every man in this picture has the responsibility to say "no" if any order does not measure up to Inland's quality standards as it passes through his stage of production.

From thorough checking of required physical specifications, through development and application of interior protective linings and designing and decorating exterior surfaces, every step of the production process is painstakingly inspected. This vigilance is your assurance that Inland "protection-eered"* containers will do their job *exactly as specified.*

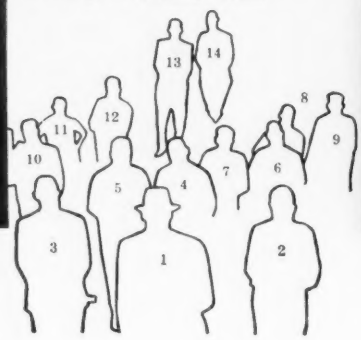
When you order Inland "protection-eered" drums and pails you can be sure of getting containers in the required quantity—when you want them—to deliver your products "as shipped."

*the right container, with the right lining for your product

# We pay them to be •no• men



Key men in Inland's quality control picture: 1) Sales Representative 2) Order Dept. Mgr. 3) Production Scheduler 4) Genl. Production Supervisor 5) Line Foreman 6) Plant Quality Control Supervisor 7) Line Inspector 8) Lining Material Compounder 9) Chief Chemist 10) Design Coordinator 11) Decorating Inspector 12) Metal Decorating Supervisor 13) Traffic Manager 14) Shipping Foreman

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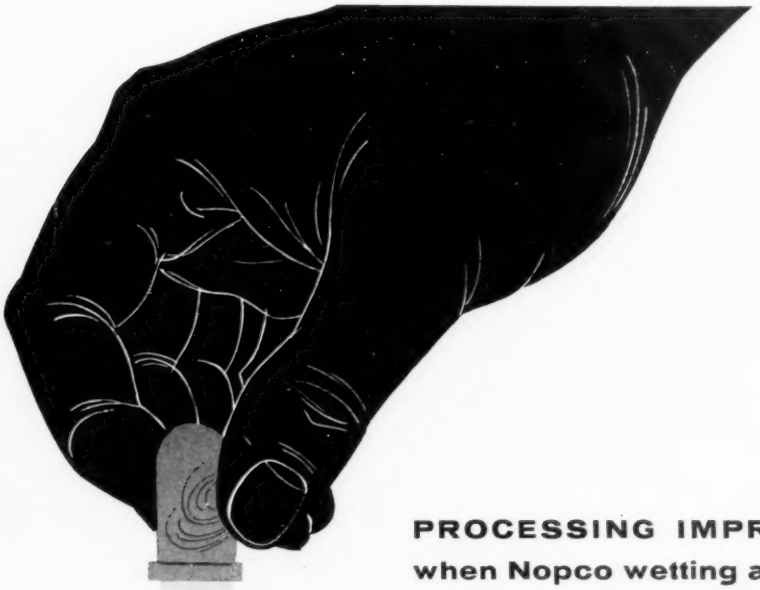
full line of steel and stainless steel shipping containers, including galvanized and heavy duty ICC drums.

A SKILLED HAND IN CHEMISTRY . . . AT WORK FOR YOU



## PROCESSING IMPROVEMENTS RESULT
### when Nopco wetting agents are used

. . . IN TEXTILES *they permit increased speed and efficiency in scouring, warp-sizing, boil-off processes, dyeing and bleaching*

. . . IN PAPER *they improve absorbency of tissue and towels*

. . . IN METALWORKING *they protect "in process" metal parts against rusting*

. . . IN ANY PRODUCT *where surface conditioning is a factor*

Nopco processing chemicals and Nopco research have brought about important economies in many fields. Quite possibly you could substantially increase the efficiency of one or more of your own processes by choosing and using precisely the right additive. Certainly the broad experience of Nopco chemists is your best assurance of finding the right one. Ask their advice—on wetting agents or anything else where practical chemistry can serve. Simply write or call our Technical Research Department. Nopco Chemical Company, Harrison, N.J.

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NOPCO VITAL INGREDIENTS FOR VITAL INDUSTRIES

Lubricants • Detergents • Sizes • Plasticizers
Softeners • Emulsifiers • Dispersing Agents
Wetting Agents • Defoamers • Thickeners

For complete information, see Chemical Materials Catalog, Page 378

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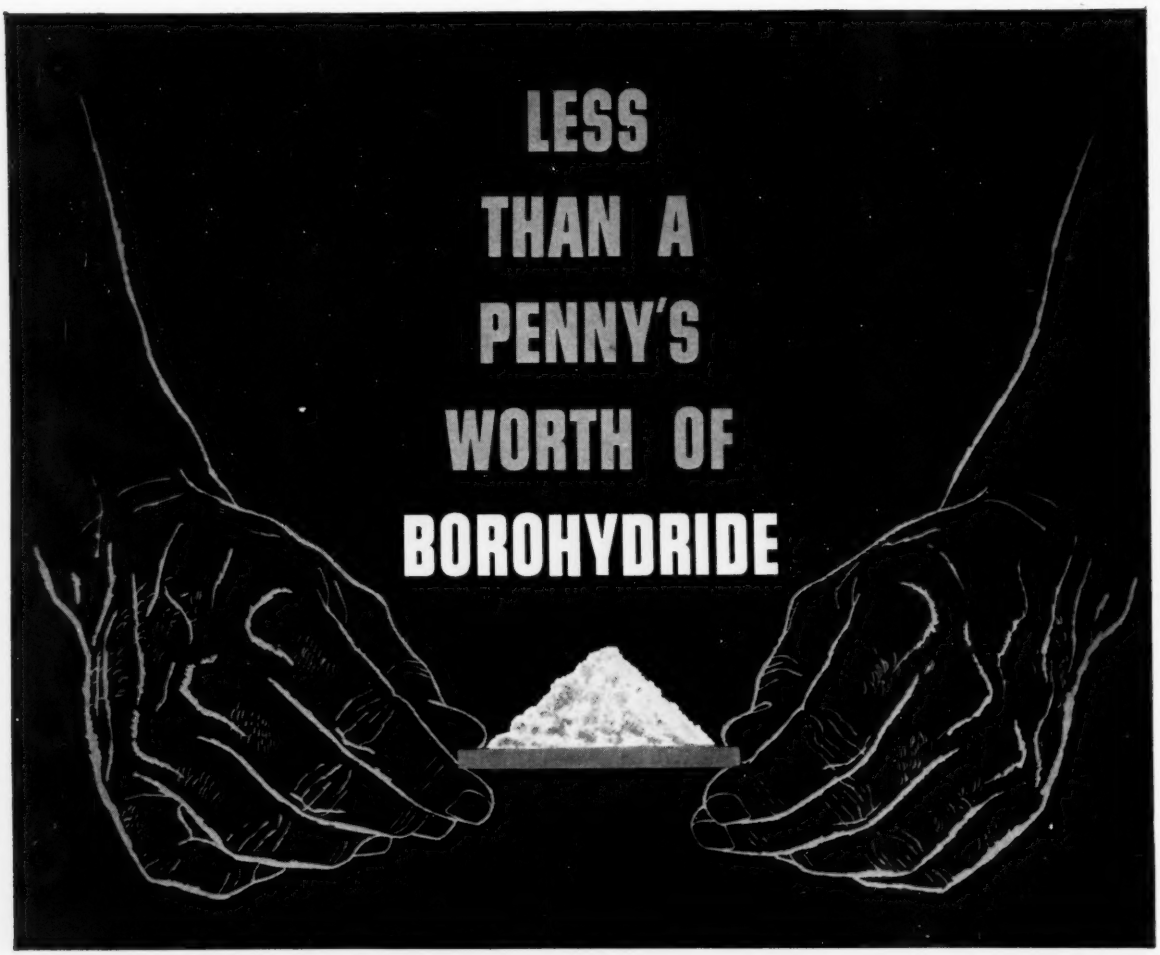



## *will "clean up" unwanted aldehydes, ketones, peroxides from a pound of product!*

Now, with either MHI sodium borohydride or potassium borohydride it is possible to "clean up" minor amounts (0.5% or less) of these unwanted contaminants effectively by simple contact methods.

This will be especially welcome news if you are now faced with the difficult problem of catalytic hydrogenation, distillation, or complicated chemical treatment to remove residual aldehydes, ketones or peroxides from your product. This is of especial importance if you must maintain color stability in your organic products, if you are concerned with carbonyl poisons in organo-metallic polymerization systems, or if you wish to reduce and inhibit peroxides in ethers. The easy borohydride method adds less than a penny a pound to the material cost of your product and may save more than that in processing costs!

Here are specific products which should respond effectively to borohydride treatment:

- ALCOHOLS
- ESTERS AND POLYESTERS
- AMINES
- NITRILES
- ETHERS AND POLYETHERS
- PENTAERYTHRITOL
- PEROXIDE CATALYZED POLYMERS
- CELLULOSE PULPS
- PEROXIDE BLEACHED ORGANIC MATERIALS *(waxes, etc.)*
- CHLORINATED HYDROCARBONS
- OXIDIZED HYDROCARBON STREAMS
- OLEFINS AND DIOLEFINS

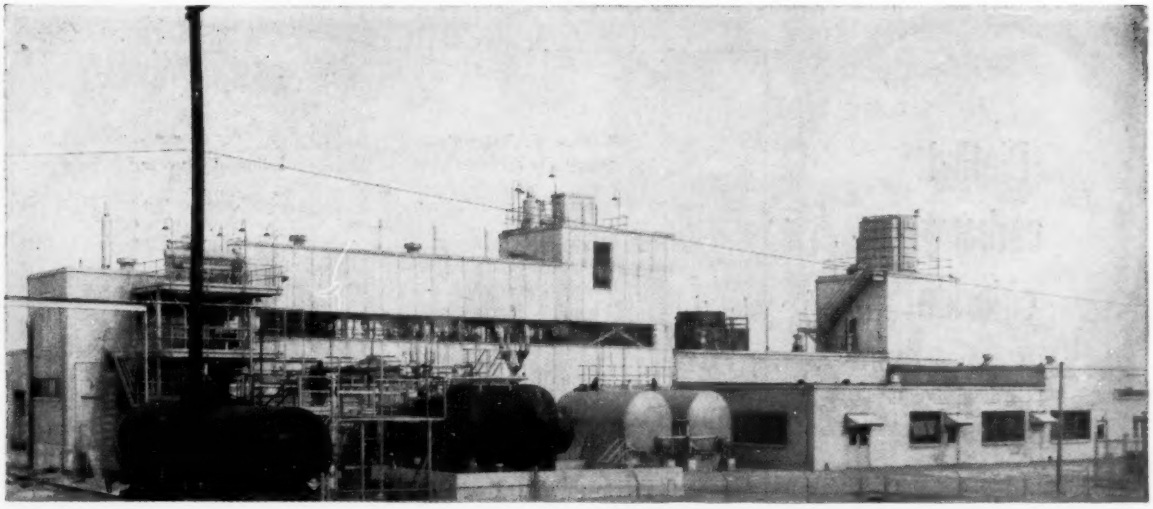
Complete information on MHI sodium borohydride and potassium borohydride is available without obligation. Write today!

CHEMICAL HYDRIDES DIVISION

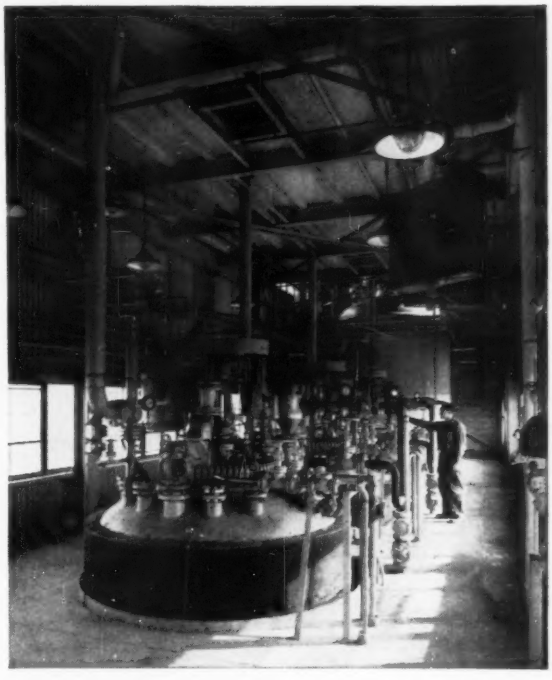
**Metal Hydrides Incorporated**

PIONEERS IN HYDROGEN COMPOUNDS

222 CONGRESS STREET, BEVERLY, MASSACHUSETTS



Polyvinyl chloride plant, designed and built for the Insular Chemical Corporation at Hicksville, New York, owned and operated jointly by Ross & Roberts Inc. and Rubber Corporation of America.



Heart of the process consists of reactors equipped with instrumentation for precise control of the process.

# How Blaw-Knox builds an idea into a profitable resin plant

**The idea:** improve production of vinyl film and sheeting by integrating a polyvinyl chloride resin plant into the operation.

**The problem:** could such a plant be built to deliver the capacity required for profitable performance.

Blaw-Knox was asked to analyze the problem in detail. Their economic and engineering studies proved the idea feasible . . . pointed the way to a pilot plant to determine formulation data.

Then, maintaining close contact with the client, Blaw-Knox moved ahead with plant construction. This program co-ordinated engineering, procurement, inspection, and cost control.

**Results:** a smoothly running plant delivering specified capacity and quality, stabilizing material flow, widening overall profit margin.

A veteran of 25 years in the resins and plastics field, Blaw-Knox provides plants tailored to individual needs at minimum cost. We welcome the chance to assist you in your current project planning.

*Blaw-Knox's 89th Resins and Plastics Facility*

BLAW-KNOX

**BLAW-KNOX COMPANY**

*Chemical Plants Division • Pittsburgh 22, Pa. • Chicago 1, Ill.*

*Birmingham • New York • Haddon Heights, N.J. • San Francisco • Washington, D.C.*

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Dimethyl carbamyl chloride

3,5-Dinitro-benzoic acid

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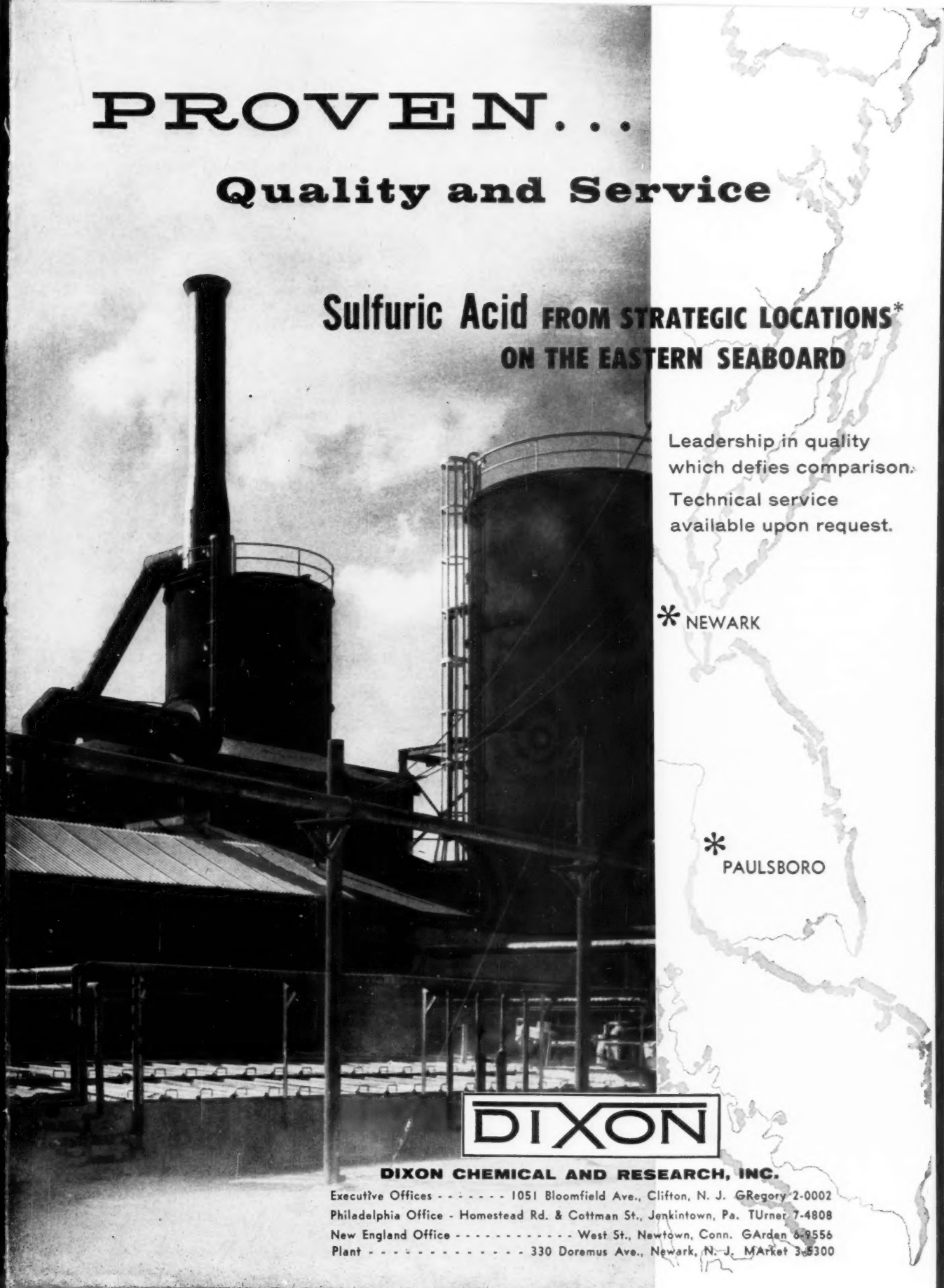
## Quality and Service



### Sulfuric Acid FROM STRATEGIC LOCATIONS* ON THE EASTERN SEABOARD

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# OPINION

## Not Using Royal Jelly

TO THE EDITOR: It was with considerable interest that we read your story regarding Royal Jelly (*Dec. 14, '57*).

It is a little discouraging to find scientists using as a reason for including Royal Jelly in a cosmetic product the fact that it will help sell it. That sounds more like an advertising department story.

However, we are more concerned with the statements on page 48 to the effect that Beauty Counselors, along with another direct-selling company, is readying a product containing Royal Jelly.

We find no basis in scientific evidence for including Royal Jelly in any cosmetic product. The fact that it is safe (increasing the cost of the cosmetic because of its inclusion), is, in our opinion, not sufficient reason for including it in a product.

We have no plans at this time to include Royal Jelly in any Beauty Counselor preparations.

M. G. deNAVARRE
Vice-President
in Charge of Research
and Development
Cosmetic Laboratories, Inc.
Detroit, Mich.

## Argentine-Owned

TO THE EDITOR: Your statement (*Feb. 1, p. 25*) . . . to the effect that our firm is largely under German ownership being erroneous, we would appreciate rectification. Whilst our company is coparticipating with a number of outstanding German chemical concerns in new local industrial companies, there is no German capital involved in our corporation. . . .

COMPANIA QUIMICA
Buenos Aires

*CW* welcomes expressions of opinion from readers. The only requirements that they be pertinent, as brief as possible.

Address all correspondence to H. C. E. Johnson, Chemical Week, 330 W. 42nd St., New York 36, N.Y.

**Leland Hazard: Pittsburgh Plate Glass vice-president, general counsel.**

## Right Man, Wrong Pic

TO THE EDITOR: In your Feb. 1 issue, you carry on page 46 a picture purporting to be one of me.

It is not, as you will see from the enclosed photograph.

LELAND HAZARD
Vice-President
and General Counsel
Pittsburgh Plate Glass Co.
Pittsburgh

*Our photo supplier goofed, mixed up the identification of the two men in the original photo. We cropped out Reader Hazard.*—ED.

## Caustic: Short or Long?

TO THE EDITOR: It may be of some interest to you to learn that a number of our Electro Chemicals people have been intrigued by your provocative article, "Caustic—Plenty for Now and Future" (*Jan. 18, p. 69*).

In talking with [your writer], we were impressed by the care he exercised in polling a cross-sectional representation of the chloralkali industry with regard to their opinions on this matter. . . .

The prognosis offered for current outlets and future markets by end-uses was sagely drawn. We fully agree that metallurgical outlets is a promising and growing outlet.

Those acquaintances of ours who heard Mr. Cremer's recent address (*CW Market Newsletter, Feb. 1*) before the Chlorine Institute, vociferously applaud his postulation that caustic soda's future demand by industry will nearly coincide with production. Although this thesis is diametrically opposite to CHEMICAL WEEK's observations, those persons whose responsibilities lie in merchandising caustic quite naturally lean toward Mr. Cremer's dynamic optimism.

It is always a privilege to study market forecasts and doubly so when diagnosed by proponents of two opposing schools of thought, particularly when they have been so ably documented.

Like other trend observers, we prefer to let a gentle sweep of time assess judgment on who is the more correct. . . .

T. A. SHEETS
Electro Chemicals Division
Diamond Alkali Co.
Painesville, O.

# MEETINGS

**American Society of Mechanical Engineers,** International Gas Turbine Power Division conference and exhibit, Shoreham Hotel, Washington, March 3-6.

**Assn. of Consulting Chemists and Chemical Engineers,** symposium and banquet, Shelburne Hotel, New York, March 5.

**New York Board of Trade, Drug, Chemical and Allied Trades Section,** 32nd annual dinner, Waldorf-Astoria Hotel, New York, March 6.

**1958 Nuclear Congress,** International Amphitheatre, Chicago, March 17-21.

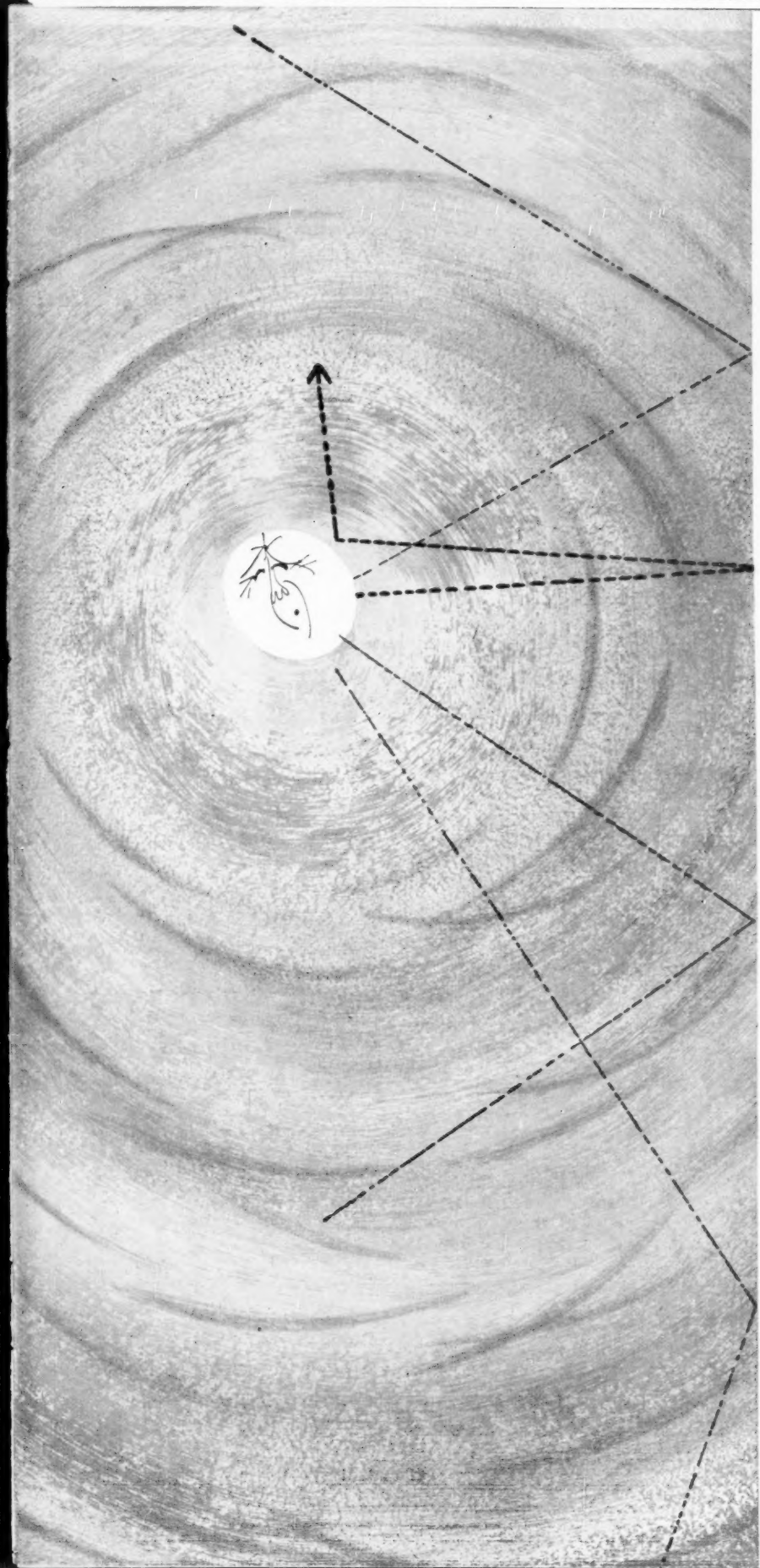
**National Assn. of Corrosion Engineers,** 14th annual conference, Civic Auditorium, San Francisco, March 17-21.

**Society of the Plastics Industry,** 15th annual Pacific Coast section conference, El Mirador Hotel, Palm Springs, Calif., March 26-28.

**American Chemical Society,** California section, chemical exposition, Civic Center Exhibit Hall, San Francisco, April 13-17.

**American Society of Mechanical Engineers,** annual design engineering show, International Amphitheatre, Chicago, April 14-17; annual national spring meeting of the American Welding Society, Kiel Auditorium, St. Louis, April 15-17.

**American Oil Chemists' Society,** annual meeting, Peabody Hotel, Memphis, Tenn., April 21-23.



# CYANAMID ULTRAVIOLET ABSORBERS

## are the answer to ultraviolet-caused DEGRADATION

The remarkable success of UV 9* Ultraviolet Absorber in preventing discoloration, embrittlement, or other ultraviolet degradation has prompted an accelerated Cyanamid program to make this most effective ultraviolet protection available in the widest range of UV-light-sensitive products.

(1) **Increased availability and service!** To broaden customer service, Cyanamid's Ultraviolet Absorbers have been assigned to the Intermediates Department. Information and direct assistance in product applications are now available from local Cyanamid Intermediates Department representatives.

(2) **A practical literature library**... has been developed and is being expanded to make available complete and up-to-date information on the proper application of Ultraviolet Absorbers in a rapidly widening range of uses.

(3) **A program to develop new ultraviolet absorbers** . . . is employing the extensive facilities and long experience of Cyanamid's research laboratories. This program is aimed at the development of a well-evaluated group of Ultraviolet Absorbers tailored to specific application areas.

**If light degradation is a problem**—or even a minor factor in your product performance, Cyanamid welcomes your inquiry. Call your nearest Cyanamid Intermediates office—or write to

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AMERICAN CYANAMID COMPANY
Intermediates Department
Bound Brook, New Jersey

CYANAMID
UV
ABSORBERS

# WILL YOU USE 5 TRUCKLOADS OF DRUMS or more OF Ethylene Oxide THIS YEAR?

If you use as many as five truckloads a year of ethylene oxide in drums, it will probably pay you to buy in tank car quantities.

**ADVANTAGES OF 3100-GAL. TANK CARS**

Consider the advantages: the cost of storage facilities for tank car lots can be fully amortized in a year — or less. At the same time, you eliminate the problem of storing and returning empty drums, the endless bookkeeping and tied up capital involved in drum deposits.

For help in deciding whether you can profitably switch your ethylene oxide purchases from drums to 3100-gallon tank cars, write or phone Allied's New York office.

Allied Chemical

Ethanolamines • Ethylene Oxide • Ethylene Glycols • Urea • Formaldehyde • U. F. Concentrate—85 • Anhydrous Ammonia • Ammonia Liquor • Ammonium Sulfate • Sodium Nitrate • Methanol • Nitrogen Solutions • Nitrogen Tetroxide • Fertilizers & Feed Supplements

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# Business
## Newsletter

CHEMICAL WEEK
February 22, 1958

**Chemical management men with an eye toward cost cutting** in these recession days will be particularly receptive to new lessons in chemical economics (*see also p. 30*):

• Despite rising costs of labor and materials, it may be possible to trim total operating costs. One company that's doing it: Bicroft Uranium, in southeastern Ontario. In an address scheduled for delivery this week, Bicroft officials report "a downward trend in costs in all categories except mining" and that "definite savings have been made in milling costs as operating techniques improved." Initially, operating costs had been estimated at $12/ton of milled concentrates; but even though wages and other expenses have increased since then, average costs have been held below that figure.

• Du Pont this week is trying for savings by taking over operations previously farmed out to contracting companies. It is taking over two titanium ore mining and refining facilities previously operated for it by Humphreys Gold Corp. Du Pont says its "do it yourself" step at the Trail Ridge and Highland ilmenite plants near the Florida towns of Starke and Lawtey stems from "the need for closer integration with other Du Pont operations."

•

**Calcium borate findings in California** created a flurry of investor interest last week. The big colemanite deposits were uncovered on the Mojave Desert. One newspaper's financial editor's conclusion: the discovering company—Kern County Land Co.—"obviously is in a strategic position—if and as the exotic-fuel program flowers." But industry experts say the finding will have no significance for boron production for a long time. All present boron business is geared to sodium borate ores—such as those of U.S. Borax and Chemical, whose deposits are considered to be the world's largest. Processing the colemanite, these authorities told CW, would involve technical problems that probably wouldn't be worth solving until the sodium borate deposits are used up.

•

**Among latest aspects of the recession in the process industries:**

• Du Pont and Chemstrand have been cutting back on nylon production; layoffs at Du Pont's four nylon plants and Chemstrand's Pensacola plant are expected to reach a combined total of 2,500 within weeks.

• Union Carbide has postponed salary reviews until April 1 and has deferred the construction of office and research facilities planned for Eastview, N.Y., "pending further study."

• In Texas, Alcoa has shut down two of the six potlines at its Rockdale reduction plant; but both Alcoa and Reynolds are continuing with construction and expansion of their alumina plants at Point Comfort and La Quinta, respectively.

**However, there's a healthy tone** to most recently announced company statements—particularly those from drug and specialty chemicals concerns.

One company that had a relatively large increase in earnings despite a decline in sales is Colgate-Palmolive. In its domestic business, C-P boosted earnings 37%, to $14.42 million. Worldwide, earnings rose 28.8%, to $19.93 million. While foreign sales increased in '57, over-all sales were down less than one-third of 1%, to $508.5 million. The dip in U.S. sales is traced to termination of a contract with Chesebrough-Pond's, covering distribution of Vaseline products.

Two pharmaceutical mainstays—Abbott and Parke, Davis—report all-time record sales and earnings for '57. P,D's sales climbed 21%, to $162.3 million, and earnings leaped 58.3%, to $27.9 million. For Abbott, sales and earnings mounted 15% and 16.8%, to $111.3 million and $12.7 million, respectively.

Heyden Newport—formed one year ago by merger of Heyden Chemical and Newport Industries—tells of sales and earnings that are slightly more than the combined totals for the predecessor companies in '56. Sales are up, from $47.9 million to $48.4 million; earnings, from $2.55 million to $2.58 million.

Diamond Alkali's sales inched up 1.1%, to $122.64 million, but earnings dropped 32%, to $7.04 million. The company notes that net income for '57 was hurt by two items that won't recur this year: a $905,000 loss on the Black Leaf Products Division (which was sold recently) and a $150,000 charge resulting from adoption of LIFO (last in, first out) bookkeeping on finished-goods inventories.

Also hard hit by last year's downturn: U.S. Rubber, whose '57 sales and earnings declined 3.1% and 6.8%, to $873.6 million and $29.7 million, respectively.

•

**One U.S. chemical company "Canadianizing"** its Canadian affiliate is American Cyanamid (New York). It's giving North American Cyanamid (Toronto):

- A new name—Cyanamid of Canada Ltd.
- A new president—Canadian-educated L. P. Moore, a 24-year Cyanamid veteran.
- More Canadians on the board of directors.
- A plan for ultimate public offering of some of the subsidiary's stock to Canadian investors.

•

**Industry and government don't want to quash boyish interests** in science, but they're concerned about teen-agers, who have been risking life and limb in unsupervised experiments in rocketry. One result: a Houston drugstore is advertising that it won't sell peroxides and other potentially explosive chemicals "without the consent and presence of parents."

**Ramon A. Mulholland discusses properties and potential uses of the**

## ALKYL BORIC ACIDS . . . R-B$<^{OH}_{OH}$

*"of special interest are their bacteriostatic, fungistatic and surface-active properties. They've been patented as gasoline additives, polymer components, stabilizers for aromatic amines"*

Ramon A. Mulholland, B.S., M.S., Indiana University
Manager, Marketing, Callery Chemical Company

**Q.** Mr. Mulholland, are these materials bacteriostatic or fungistatic?

**A.** Both. Screening tests show that Nonyl Boric Acid completely inhibits growth of three bacteria and three molds in dilutions as high as 1:25,000 and has some effect even at 1:1,000,000. Dodecyl Boric Acid is active against four of these common microorganisms.

**Q.** Can polymers be made from the Alkyl Boric Acids?

**A.** Polymers prepared from alkyl chloro silanes and Alkyl Boric Acids have been patented. Other co-polymers should be possible.

**Q.** Are these materials stable at high temperatures?

**A.** The Alkyl Boric Acids tend to lose water and form cyclic anhydrides known as boroxins. These oil-soluble trialkyl boroxins have been suggested as components of oil additives for stabilization against oxidation and polymerization.

**Q.** How about the present and future availability of the Alkyl Boric Acids?

**A.** At present, Nonyl and Dodecyl Boric Acids are obtainable in research quantities, with production of larger quantities at Callery's Lawrence, Kansas Plant to follow.

*Write or phone for specific information on the Alkyl Boric Acids*

*Phone: FOrest 4-1130 TWX: Perrysville, Pa. 117*

**Q.** Can other Alkyl Boric Acids be made?

**A.** Various Alkyl Boric Acids can be made with different alkyl, cyclic, and functional groups. If you expect that a particular compound might have the right properties for your product or process, we would like to hear from you.

**Q.** Are the Alkyl Boric Acids like the silicones in any way?

**A.** They appear to be like the silane diols in apparently bonding to glass surfaces. For instance, the glassware in which the bacteriological tests were made had to be carefully cleaned to permit further testing.

**Q.** Are these materials stable to hydrolysis?

**A.** Nonyl and Dodecyl Boric Acids appear to be quite stable to either acid solutions or alkaline aqueous solutions.

**Q.** What industries might use these acids?

**A.** In the manufacture of paper for control of slime organisms. In paint, leathers, and polymers to minimize bacterial damage. In the oil industry as petroleum additives, and many others.

CALLERY
CHEMICAL COMPANY
PITTSBURGH 37, PENNSYLVANIA

# Falling barometers, conflicting opinions underscore the big question . . . . .

January Idle 4,494,000; Up 1,120,000 in a Month

Increase Greatest Since Surveys Started in 194

Early Turn-around Still Largely Guesswork

Difficult Year

Good Ye

By Shar

Stump Hits Lashire Mills

Tape Lags During Afternoon Slide—Average Declines 3.20 Points to 276.52

Weekly Issue of Treasury Is Sold at Cheapest Cost Since La

Prime Phone Bonds A on Market Here at 3. Largest in 13 Mo

LEVELING-OFF HELD NO CAUSE OF ALARM

'Our H... Year Is Behind Us Now,'

Crude oil runs

RECOVERY FADE

STOCKS SLIP BAC

Business News Depressing —Rails, Steels, Motors and Metals Weakest

INDEX OFF 3.18 TO 279.62

Missile Shares Lead Strong Opening, but Lose Most of Ga

Tobaccos Hold als, Chemicals Notably Weak

REGISTER GAINS

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Relief

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Sagging Economy

Economist Urges US Spur Private Spending

Better Sale

LLOYD VOICES OPTIMISM

Rally With Prices Curtiss Is Heavily Sold —Lorillard Reacts

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Position's Better

Consumers' Instalment Debt Continues to Rise

Few Price Changes Noted

New Spiral Looms Despite Broad Declines in Output and Other Sectors

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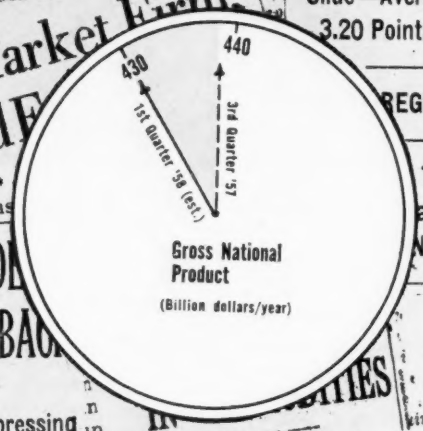
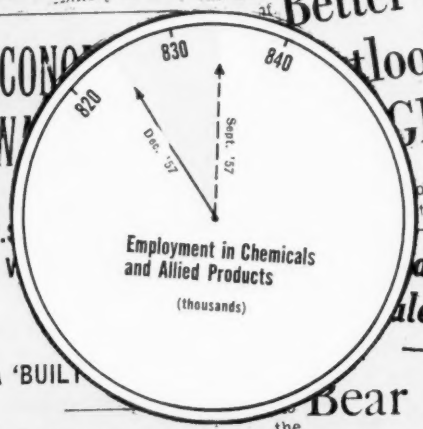





ailroad Had Been Paying a 67½c Quarterly—Profit Sharply in '57

# Is Recession Crimping CPI Plans?

**Despite the falling economic barometers, chemical process companies are not furling their sails. Research and development budgets are not being pinched, and building is proceeding apace. Goodyear's decision last week to build a $9-million polyester film plant (see p. 71) is the latest evidence of the industry's optimism.**

It indicates that when promising new products and processes are ready, the CPI will not hesitate to build—no matter how the economic indexes read at the moment.

Further insight into the CPI's faith in long-term growth prospects came last week in a round-table discussion among a group comprising economists of two major chemical companies, a banker-specialist in chemicals, a representative of the McGraw-Hill Dept. of Economics, and *CW* editors. Included: staff economists E. T. Dunn, of Allied Chemical, and Ralph Burgess of American Cyanamid; Vice-President Roland Soule, of Irving Trust Co.; Douglas Greenwald, of McGraw-Hill Economics.

The subject: How will the current recession bear on decision-making in the CPI? Consensus: it will have little effect, provided the upturn comes before the end of this year.

*Here are highlights of the two-hour tape-recorded session:*

**Question:** What economic indicators do you rely on now in advising management on capital expenditures?

**Answer:** For the long-range outlook, the factors that we examine, review and analyze are those concerning our largest customer markets—textile industry, paper industry, agriculture, pharmaceuticals. We attempt to make long-term projections of demand and output in those customer industries; and those projections are translated by our sales staff into forecasts and long-range projections for individual products or groups of products.

**Q:** How immediate an impact will recession have on capital spending?

**A:** I think that short-run business fluctuations have very little direct effect on capital expenditure planning. Indirectly, I think the fact that we are in a recession would make any long-range projections for customer sales, unit sales, prices or profits much more conservative than they would be if they were made during a "boom."

**Q:** How long would a recession have to roll along before you would begin to review your long-range capital expenditure programs?

**A:** Obviously a recession is going to have its effects on money rates, on retained earnings, on opportunity to finance an expansion. It has an important effect on earnings and on business and investor confidence, and therefore impairs ability to finance the expansion. So, sooner or later, those factors undoubtedly would have their effects; but it would be almost entirely a guess to say when they would begin to play an important part.

**Q:** What kind of capital investment project is most vulnerable to a recession?

**A:** If you get the contract to supply a new customer who needs large quantities of sulfuric acid, for instance, or if an old customer needs increased quantities, you are going to put up a new acid plant or expand your old one, whether there's a recession or not. In case of replacement of obsolete equipment, you'll defer these jobs if possible, but there comes a time when you have to make replacements, irrespective of business conditions. One thing that's deferrable is new-product projects. If you carry on research work, you are going to bring to fruition a certain number of new products each year. Some of them will involve small capital facilities; others are major. You may defer the big project for awhile, but then the other fellow gets ahead. If the return is going to be large, you'll go ahead, figuring that the recession may end before you get your plant up. So, all in all, the recession won't interfere with expansion very much, because you have leeway on only one kind of expenditure.

**Q:** So that a recession mainly makes you a lot more selective?

**A:** It just makes management men sharpen their pencils and figure their plans a little more carefully and much more conservatively than they would if business were booming.

**Q:** Is it your thesis that if research spending remains at a high level, new products and processes will provide an impetus to capital spending?

**A:** From the very nature of products developed by research, they will either replace an existing product or do a job better. You might say they'll always cut somebody's costs. I believe that during the depression Mathieson spent a lot of money on modernization; in other words, comes a depression, you spend money to cut costs.

**Q:** How does competition stack up as a factor in recession-time planning?

**A:** If you don't perform the research and build the plants to make new and better products, your competitor is going to do so, and you'll lose out in the long run unless you keep pace.

**Q:** How does promptness of collections figure into this?

**A:** It's chiefly in plastics that we find chemical companies acting as bankers for slow-paying customers. If you relate receivables to sales, you'll find that the ratio is highest—this is a broad generalization—for companies that have the highest percentage of sales to plastics fabricators. This reduces the suppliers' liquidity ratios—which are down rather sharply from four or five years ago. And if earnings should continue their downward trend and if dividends should be maintained at present levels, the combination of lower retained earnings plus higher receivables might force companies to defer capital expenditures.

**Q.** How optimistic are you about the near future?

**A:** I think it has been characteris-

tic that in a prolonged period of inventory adjustment, capital expenditures will begin to decline; and this can feed on itself. Frankly, I don't expect that after June 30 everything is going to be for the best. The most I hope for is that in the latter part of the year, we will approach stabilization.

**Q.** But if research expenditures are holding up . . . ?

**A:** Research expenditures are a long-range investment, and have little or no effect, we believe, on short-term conditions in the industry.

**Q:** At what level will stabilization come?

**A:** Many people are looking for stabilization somewhere around the current level; but maybe it will take three or four years to build up to it.

**Q:** This question of whether we are now above the long-term trend-line for gross national product—to what extent is this taken into consideration in connection with chemical companies' capital expenditures?

**A:** I think—at least in our own case—not much consideration is given to it, because we are all optimistic over the long term. Take the case of nitrogen. There's an overcapacity in the industry now, but nobody is pessimistic about what the situation will be five or 10 years hence because population requirements will be there. But that isn't saying that no one will get hurt in the interim.

**Q:** So you think there may be new producers in some of the fields that now seem relatively crowded, such as isocyanates?

**A:** Perhaps the answer is that there will be sufficient capacity relative to demand, or that there is now, so the prices won't be as favorable as anticipated. Therefore, some of these products may not be as profitable as had been thought. In other words, there may be a slow-up in expansion of capacity for ammonia or polyethylene as a result of the growing number of chemical companies getting into those businesses.

**Q:** So the watchword now is "more caution"?

**A:** That's true, particularly in the case of ammonia. Not everybody is considering that product anymore. And when people do look at it, they are very careful about deciding to go into the business. That about characterizes the present situation.

# Call for Aid to AEC

**The need for more federal aid for basic research rang out as the keynote of last week's hearings of the Joint Congressional Committee on Atomic Energy. Fifty top scientists testified at the two-week, highly technical survey on U.S. progress and needs in basic research.**

The hearings were conducted by the committee's research and development unit headed by Rep. Melvin Price (D., Ill.). Purpose: to sell Congress on higher appropriations for basic research. Traditionally, Congress has preferred to vote money for specific hardware.

Price has stated, "Lack of sufficient funds and inadequate facilities are among the chief obstacles to continued progress in our physical research program, both in the civilian and defense fields." He proposes that basic research spending be hiked by at least 50%.

**More for Atoms:** Two of the witnesses—Glenn Seaborg, associate director of University of California's radiation research laboratory at Berkeley, and Frederick Seitz of the University of Illinois—called for a 50-100% increase in basic atomic research as soon as possible.

Seaborg said the U.S. spends only $250 million/year from public and private sources on basic research. The AEC handles only $70 million of this. Only a few industrial firms carry on large-scale research, he said, because the work may not pay off for many years. And universities cannot afford equipment like a multimillion-dollar accelerator. Thus, Seaborg concluded, any real boost to basic research must come from the government.

**Pride and Caution:** Isador Rabi, 1944 Nobel prize-winning chemist, of Columbia University, praised U.S. progress in basic research over the past 30 years. But, he warned, the Russians are moving up fast, and may pass us unless we spend more on basic research and correct the failure of secondary schools to give students a proper grounding in science.

In his progress report, Seaborg told the subcommittee that experiments with heavy elements already have led to important discoveries in uranium processing and extraction, and have opened the way to shortcuts in the processing of used fuel elements for reactors.

Seitz pointed to advances in metallurgy, but called for much more study of changes in metals subjected to high temperatures and radiation in nuclear reactors.

Starting this week, the joint committee will hear the AEC's annual report on atomic power progress. Chairman Lewis Strauss will face a Democratic majority that is openly unhappy about the atomic power program. Democrats have been demanding that the government put more money into faster reactor development for experimentation at home and for export of technology and equipment abroad.

## Open to Argument

**A "free trader" spoke at last week's meeting of the Synthetic Organic Chemical Manufacturers Assn. in New York's Roosevelt Hotel—Assistant Secretary of Commerce Henry Kearns. And his reception proves that free-trade sentiments are not "verboten" in chemical industry circles.**

Kearns' speech was programed, say SOCMA officials, so members could hear latest low-tariff arguments. SOCMA accepts the reciprocal trade program in general, but traditionally opposes across-the-board tariff cutting.

In his SOCMA speech, Kearns called for five-year extension of the reciprocal trade act and general liberalizing of trade policies. He cited figures showing that in industrial chemicals, exports have increased and imports have not kept pace since the '53 extension. In '51, Kearns stated, U.S. chemical exports exceeded chemical imports in value by $500 million; and in '56, the excess was up to $900 million.

In the discussion following the speech, however, some SOCMA members pointed out that certain segments of the industry—such as textiles and dyes—have not shown comparable export-import ratios.

And others questioned Kearns' five-year figures, stating that import totals are based on dollar value in the European market, while exports are based on U.S. prices.

## Tax Break in Baltimore

**Bowing to a storm of criticism,** Baltimore Mayor Thomas D'Alesandro is now calling for elimination of city taxes on advertising and gradual reduction of levies on machinery and inventory. The levies had set a precedent throughout the country for cities and states seeking to fatten revenues, and had started an industry exodus from Baltimore.

Until the mayor pushed his tax bill through the city council in 1956, equipment and inventory had been exempted from the local property tax (currently $2.98/$100 of assessment).

Wiping out this exemption threw Baltimore's business community into turmoil (*CW, Dec. 8, '56, p. 23*). Process firms were among the many companies that sounded the alarm. Food Machinery and Chemical, Davison Chemical, Revere Copper & Brass, Olin Mathieson, Resonol, and Noxzema all canceled Baltimore building plans or threatened to move operations away from the city. They contended the tax squeeze would hamper their competitive positions.

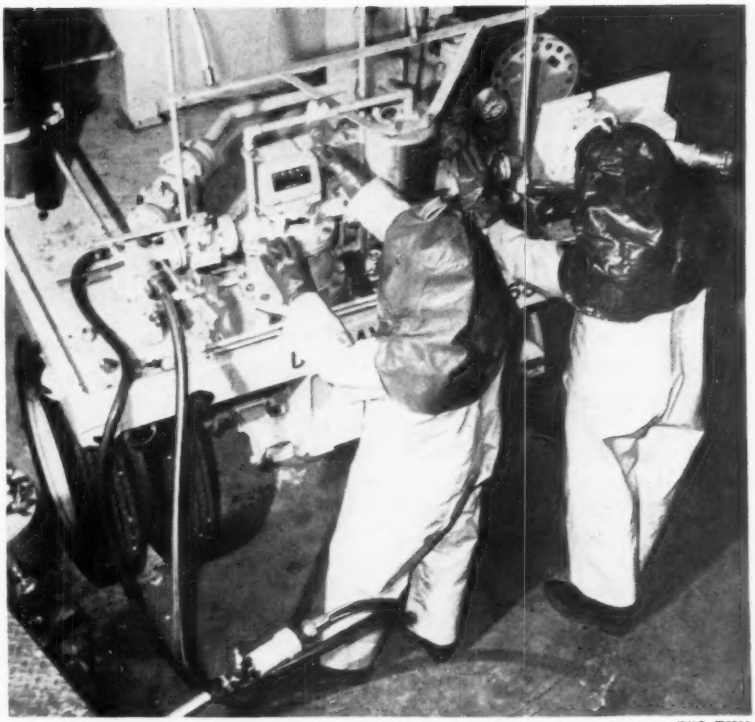
Now, in time for his campaign for a Senate nomination—but not before payment of some $2.4 million in advertising taxes—the mayor will lift his unpopular levies. Baltimore business men, hailing the move, agree with the mayor that it will give a big lift to the city's economic future.

## Drug Firms' Defenders

**Medical witnesses** testifying before a House Governmental Operations Subcommittee last week gave a generally clean bill of health to drug firms promoting tranquilizers. Subcommittee members heard six doctors voice their opinions on whether firms have gone overboard in presenting the favorable effects of the drugs in promotional material sent to medical men.

Dr. Nathan Kline, research director of the New York State Dept. of Mental Hygiene, stated earlier in the hearings that the occasional excesses had been followed by strong counter-reaction among doctors and drug manufacturers.

If the government must police tranquilizer promotional material, most witnesses felt, the Food & Drug Administration, not the Federal Trade Commission, should do the job.



WIDE WORLD

**Fueling missiles: Liquid propellents will have stronger rivals.**

# Solid Fuels Will Grow

**Solid propellents have the biggest single growth potential of all chemical supplies for the field of rockets and missiles, two industry executives declared last week.**

But both company officers—Thiokol President Joseph Crosby and Olin Mathieson Vice-President Harry Sosnoski—stressed that fuels are not the only area in which chemical companies can contribute to the U.S. missile program. Pointing out that rockets and missiles are a chemical market that has spurted to 100 times its dollar volume of 11 years ago and is still expanding rapidly, they cited these examples of other process industry opportunities: manufacture of plastics and ceramics for nose cones; preparation of zirconium and titanium for air frames; extraction of cobalt and other metals for special alloys; purification of silicon and zirconium for guidance system transistors; and development of explosives for warheads.

In Baltimore, Sosnoski—head of OM's High Energy Propellents Division—told members of the Baltimore Chemists Club that solid fuels will soon be allotted "much more" than their present 10% share of U.S. funds being spent on missile fuels. However, he added that liquid fuels will continue to be widely used.

"No matter what kind of propellent proves best," Sosnoski declared, "the total market for rocket fuels will be very big indeed." He pointed out that federal funds obligated for missiles in '59 amount to $5.8 billion, compared with only $58 million spent in '46. "And demands for propellents," he added, "are going up proportionately."

In New York that same evening, Crosby expressed a similar view in his talk to Chemical Industry Assn. members. Solid fuels, he asserted, are practical for defense purposes because of their simplicity and ease of handling. But he said that liquid fuels are still essential for many types of missiles.

Crosby noted that rocket engines much larger than present models are now being researched.

## COMPANIES

**G. D. Searle & Co.** (Chicago) will strengthen its position in steroid drugs by acquiring Root Chemicals Inc. (Puerto Rico) and its Mexican subsidiary, Productos Esteroides, S.A. As a wholly owned subsidiary, Root will give Searle access to a major source of raw materials used in making various steroid drugs. Basic product is diosgenin, obtained from barbasco root and used as starting material for production of progesterone and other intermediates for steroid products.

Searle's '57 sales and earnings were both at record high levels. Sales rose 8.6%, to $30.6 million; earnings were up 5.2%, to $6.9 million.

•

**Purdue Frederick Co.,** New York pharmaceutical concern, is taking over Blair Laboratories (Short Hills, N.J.) as the third move in an expansion program that started with formation of Latin American and Canadian marketing subsidiaries last year. Blair will become a Purdue Frederick subsidiary and will relocate in New York, but will continue to market drug products under its own label.

•

**Lithium Corp. of America** and **Brooks & Perkins, Inc.,** have agreed to a joint venture in research and development of new lithium-containing metal alloys. LCA (Minneapolis) is the nation's largest producer of lithium metal and compounds. Brooks & Perkins (Detroit) is a major fabricator of magnesium and other light metals.

•

**Oregon Metallurgical Corp.** (Albany, Ore.) will sell 500,000 shares of newly authorized $1-par stock to recently organized Northwest-Pacific Co. at $2/share to raise capital for expansion and diversification. The company produces ingots and castings of zirconium, titanium and other metals.

## EXPANSION

**Cement:** American-Marietta will start a $1-million expansion of its Roberta cement plant (Shelby County, Alabama) in about two months. The new addition, slated for completion in mid-'59, will boost the plant's cement capacity 25%, and chemical-grade lime capacity 40%. Last June, A-M completed a 1.5-million-bbls./-year cement unit at Roberta.

•

**Sulfuric Acid:** The New Jersey Zinc Co. (New York) is expanding its zinc sulfide roasting facilities at its Palmerton, Penn., plant. By-product sulfuric acid capacity will swell by 40,000 tons/year.

•

**Cryolite:** United Heckathorn Co. (Richmond, Calif.) may build a $250,000 artificial cryolite plant at Garfield, Salt Lake County, Utah, if Western Phosphates, Inc., agrees to supply the necessary flourides. The proposed plant site is adjacent to Western Phosphates' triple superphosphate and ammonium phosphate plant. Western is owned by Stauffer Chemical Co. and Garfield Chemical and Mfg. Co.—a subsidiary of Kennecott Copper Corp. and American Smelting and Refining Co.

•

**Industrial Gases:** Callery Chemical Co., prime contractor for the Navy's $38-million boron fuel plant now abuilding at Muskogee, Okla., has awarded a $3.4-million subcontract to The Girdler Construction Division (National Cylinder Gas Co.). Girdler will build hydrogen, nitrogen, and carbon dioxide plants, scheduled for completion in the late summer. National Cylinder's Girdler catalyst plant in Louisville, Ky., will supply specialty catalysts for the hydrogen plant.

•

**Liquefied Gases:** Imperial Oxygen Ltd. is completing a $1-million expansion of liquid oxygen, nitrogen and argon facilities in Toronto. Lox output will be stepped up sixfold.

## FOREIGN

**Chemicals/India:** More European firms are investing in India's budding chemical industry:

• Following up British Imperial Chemical Industries' announcement of a planned $25-million expansion in India (*CW, Feb. 8, p. 34*), British Oxygen Co. (London) has decided to sponsor a $7-million expansion. British Oxygen's wholly owned subsidiary, The Indian Oxygen & Acetylene Co., holds a virtual monopoly on India's industrial and medical gas production. The firm will now strengthen its position with a new plant at Burnpur (West Bengal) and increase capacity at its Calcutta plant. To comply with Indian policy, the British parent company has converted IOAC into an Indian public limited company, called Indian Oxygen Ltd., and is selling Indians 30% of the stock, valued at $1.2 million, at a 30% premium. Within the last four years, IOAC has doubled both sales, from $4.1 million to $8.7 million, and profits, from $322,770 to $661,080.

• Messrs. A. B. Chomatur (Stockholm) will ship an acetic acid plant to Hyderabad Construction Co., Ltd., for installation in Hyderabad. The plant will save India an estimated $630,000/year in foreign exchange. India now imports all her acetic acid at $315/ton.

• East Germany's AGFA has reportedly won the Indian government's approval to contribute technical and financial aid in the construction of a raw film plant. Most likely location is Kodaikanal, Madras. The plant will cost an estimated $16 million, and will probably roll out some 400-500 million ft./year of film of all types.

•

**Minerals/Russia:** Russia has discovered what are probably its richest coal deposits, in the Far Eastern peninsula of Kamchatka, according to *Soviet Weekly*. They may yield about 8 billion tons. The peninsula also claims deposits of oil, sulfur, peat, copper, molybdenum and mercury. Underground steam is also on tap, and will power an electric station planned for the area.

# POWELL

## world's largest family of valves

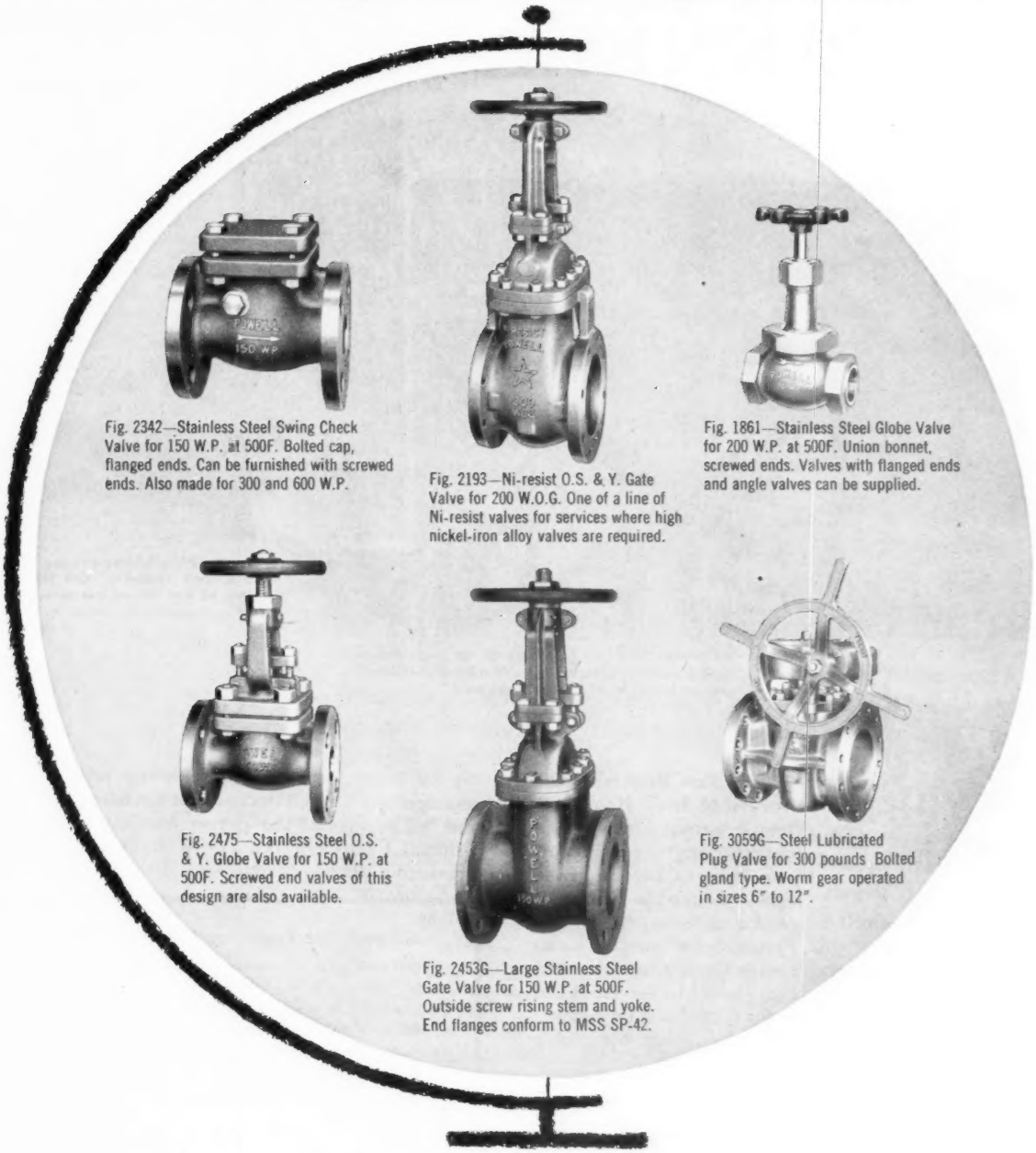


Fig. 2342—Stainless Steel Swing Check Valve for 150 W.P. at 500F. Bolted cap, flanged ends. Can be furnished with screwed ends. Also made for 300 and 600 W.P.

Fig. 2193—Ni-resist O.S. & Y. Gate Valve for 200 W.O.G. One of a line of Ni-resist valves for services where high nickel-iron alloy valves are required.

Fig. 1861—Stainless Steel Globe Valve for 200 W.P. at 500F. Union bonnet, screwed ends. Valves with flanged ends and angle valves can be supplied.

Fig. 2475—Stainless Steel O.S. & Y. Globe Valve for 150 W.P. at 500F. Screwed end valves of this design are also available.

Fig. 2453G—Large Stainless Steel Gate Valve for 150 W.P. at 500F. Outside screw rising stem and yoke. End flanges conform to MSS SP-42.

Fig. 3059G—Steel Lubricated Plug Valve for 300 pounds Bolted gland type. Worm gear operated in sizes 6" to 12".

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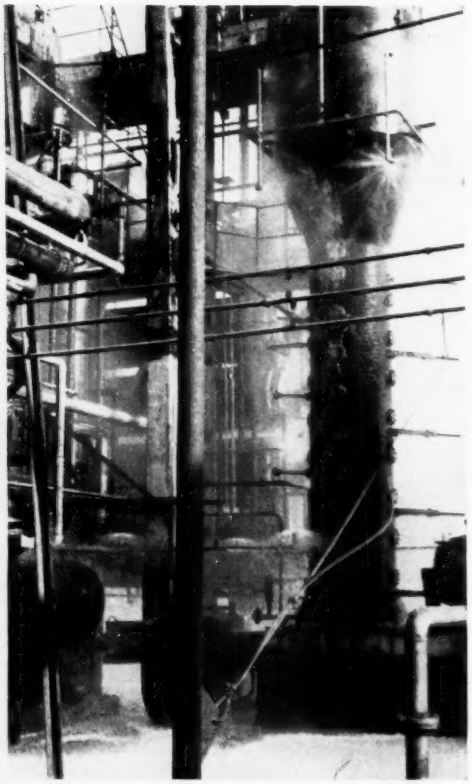
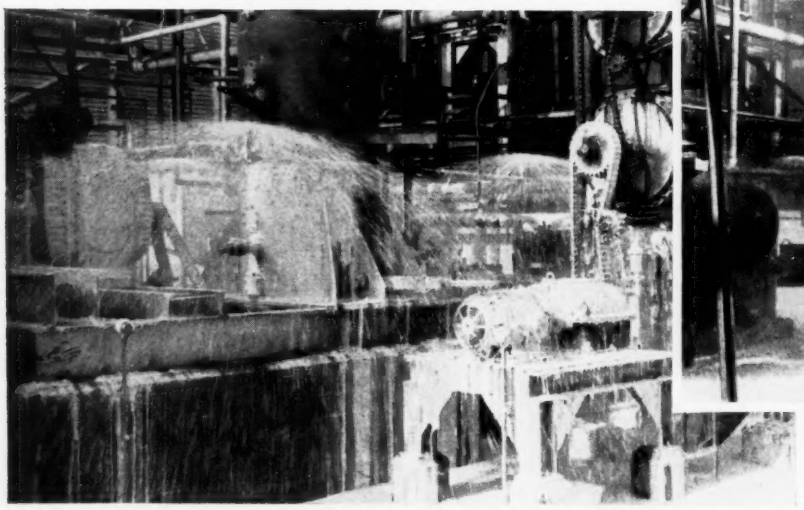
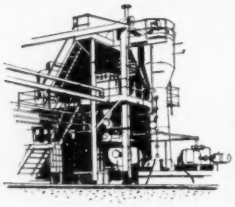
# Tough Fire Protection Problem Solved by GRINNELL



▲ Grinnell ProtectoSpray on upper part of unit cools equipment and washes burning oil and solvent into area protected by foam blanket below.



▲ Grinnell ProtectoFoam safeguards the lower section of hexane solvent extraction unit with a blanket of foam, to prevent formation of explosive mixtures.



At Canadian Vegetable Oil Processing Ltd., Hamilton, Ontario, hexane solvent is used in extracting vegetable oil from soybeans. Because of the highly flammable nature of the solvent, Grinnell designed a special system for this unit, consisting of 162 ProtectoSpray nozzles — to drench the superstructure with fine water spray; and 24 ProtectoFoam spray heads — to blanket the diked area with foam. This water-foam combination protects the lives of personnel, as well as shielding equipment from costly damage.

Solving tough fire problems like this with installations engineered to the hazard, tailored to the need, built of highest quality materials is something Grinnell has been doing successfully for more than 85 years. Check the list below for the Grinnell System suited to your requirements. Or, tell us about the fire hazard you face, and let us suggest the proper installation for you. Grinnell Company, Inc., 277 West Exchange Street, Providence, Rhode Island.

**Grinnell Fire Protection Systems include:**

- Automatic spray sprinklers — wet pipe, dry pipe, Simplex, and deluge systems
- Emulsion and vapor dilution extinguishment with water sprays — Mulsifyre and ProtectoSpray systems
- Cooling, insulation and controlled burning with water sprays — ProtectoSpray systems
- Mechanical foam blanket — ProtectoFoam systems
- Carbon dioxide systems
- Dry chemical systems

*Manufacturing, Engineering, and Installation of Fire Protection Systems since 1870*

# Washington
## Newsletter

CHEMICAL WEEK
February 22, 1958

**The Administration is in a quandary over the economic future** (*see p. 30*). The statements you have been getting from the White House, and from Republican leaders in the traditional Lincoln Day speeches, need some clarifying.

The Administration was distressed by last week's unemployment figures that put the total for January at 4.5 million. The figure was at the extreme high range of what the Administration had expected. (December unemployment was only 3.4 million.)

So the President and his advisers felt the need to say something to fill the vacuum—keep Democrats in Congress from demanding an anti-recession program before the Administration felt it prudent to do so. That is the background of Eisenhower's statement that he expected the beginning of the end of the downturn to come in March.

The softness in the economy is not yet a general thing. The growth industries—chemicals, electronics, and the service trades—are still relatively healthy. Next month's Commerce Dept.-Securities & Exchange Commission report on capital expansion will be a crucial indicator. To date, the evidence is that the chemical industry will continue its healthy growth, that expansion is continuing strong while other industries are lethargic.

Industrial prices are declining. The Commerce Dept., however, in reporting for January and early February, finds that wholesale prices (the price of large-lot purchases) fell from an index of 126 to 125.8. Lower prices came in petroleum fuel, crude natural rubber, waste paper and boxboard, and nonferrous metals.

•

**The Administration is fighting hard** for its voluntary program restricting crude oil imports. Secretary of Commerce Weeks is making personal appeals to importing companies that have ignored the program or which have not been complying fully.

Weeks wants to avoid recommending that President Eisenhower use his powers to require lower oil imports. Weeks also wants to avoid a Congressional fight to give Eisenhower explicit authority to control the flow of foreign oil into the U.S., which could hurt chances of extending the Reciprocal Trade Agreements Act.

But the fight will come anyway if the voluntary program is deemed a failure. Should the present voluntary approach begin to stagger, watch for Weeks to try to strengthen it—through such actions as redefining the term "importer" to eliminate brokers—at least, long enough to give the reciprocal trade bill a chance in Congress without bringing on oil-state opposition.

# Washington Newsletter

(Continued)

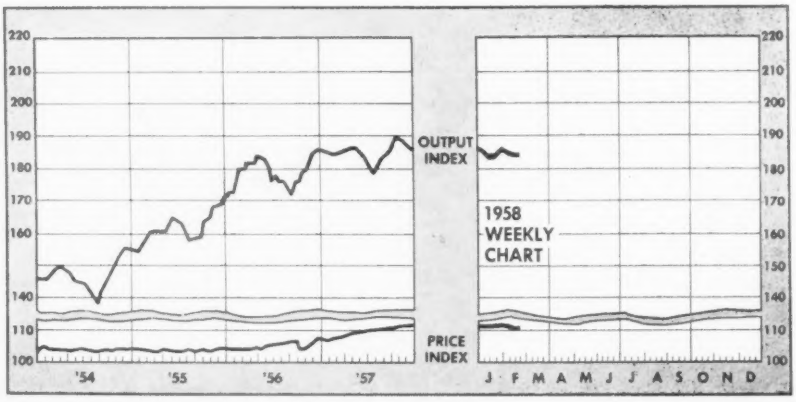
**Technological advances in chemicals** are getting a show in Washington. The Commerce Dept. is displaying, starting Feb. 18, an exhibit of 17 chemical companies in the main lobby of the department's 14th and Constitution Ave. building. The display will show products that have come from discoveries by industry research, and will continue through March 14.

•

**The Kefauver investigation** of pricing policies is taking a new turn. The Senate Antimonopoly Subcommittee has wound up its inquiry into auto pricing, now is turning to some broader fields.

Kefauver has a host of topics he wants to turn to next. These include more hearings on administered prices in such industries as baking, milk, farm machinery and aluminum. Sometime in the next year, he wants to investigate so-called conglomerate mergers and the overseas operations of American companies. There also will be hearings on such legislative proposals as a bill to limit the "good faith" defense to price-discrimination charges and a bill to require big companies planning a merger to give advance notice to government antitrust officials.

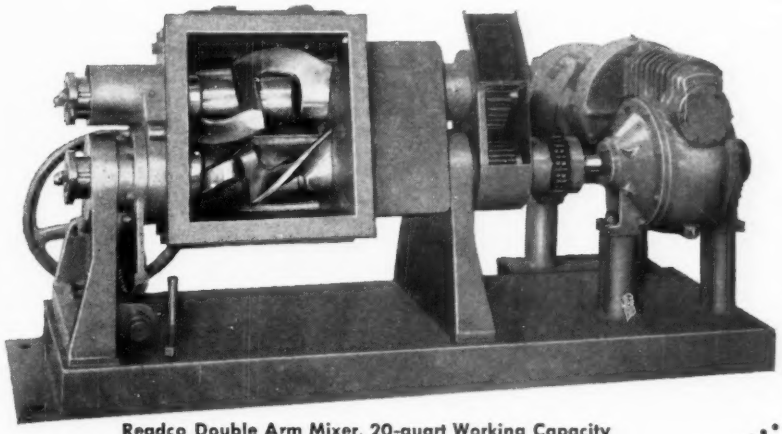
The complexity of this program indicates there will be many hearings—Kefauver just won a new $365,000 subcommittee budget for the coming year—but few solid results, such as new legislation.




## Business Indicators

| WEEKLY | Latest Week | Preceding Week | Year Ago |
|---|---|---|---|
| **Chemical Week** output index (1947-49=100) | 185.5 | 185.0 | 186.0 |
| **Chemical Week** wholesale price index (1947=100) | 110.7 | 110.8 | 108.3 |
| Stock price index of 11 chemical companies (Standard & Poor's Corp.) | 39.81 | 41.43 | 40.62 |

| MONTHLY Trade (million dollars) | Manufacturers' Sales | | | Manufacturers' Inventories | | |
|---|---|---|---|---|---|---|
| | Latest Month | Preceding Month | Year Ago | Latest Month | Preceding Month | Year Ago |
| All Manufacturing | 26,684 | 27,221 | 28,846 | 53,573 | 53,871 | 52,295 |
| Chemicals and allied products | 1,873 | 1,941 | 1,936 | 3,826 | 3,763 | 3,594 |
| Petroleum and coal products | 2,694 | 2,717 | 2,786 | 3,613 | 3,657 | 3,249 |



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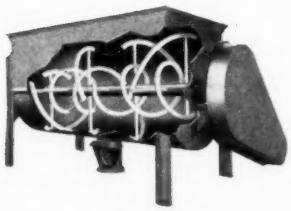
Ruggedly built of Type 316 stainless steel, or any commercial alloy, Readco lab and pilot plant mixers will efficiently handle even heavy viscous material. They are available from stock in 1, 3, 6, 20 and 40-quart working capacities, with fixed or variable speed drives. For more information see Chemical Engineering Catalog, pages 1483-1490 . . . or write direct.



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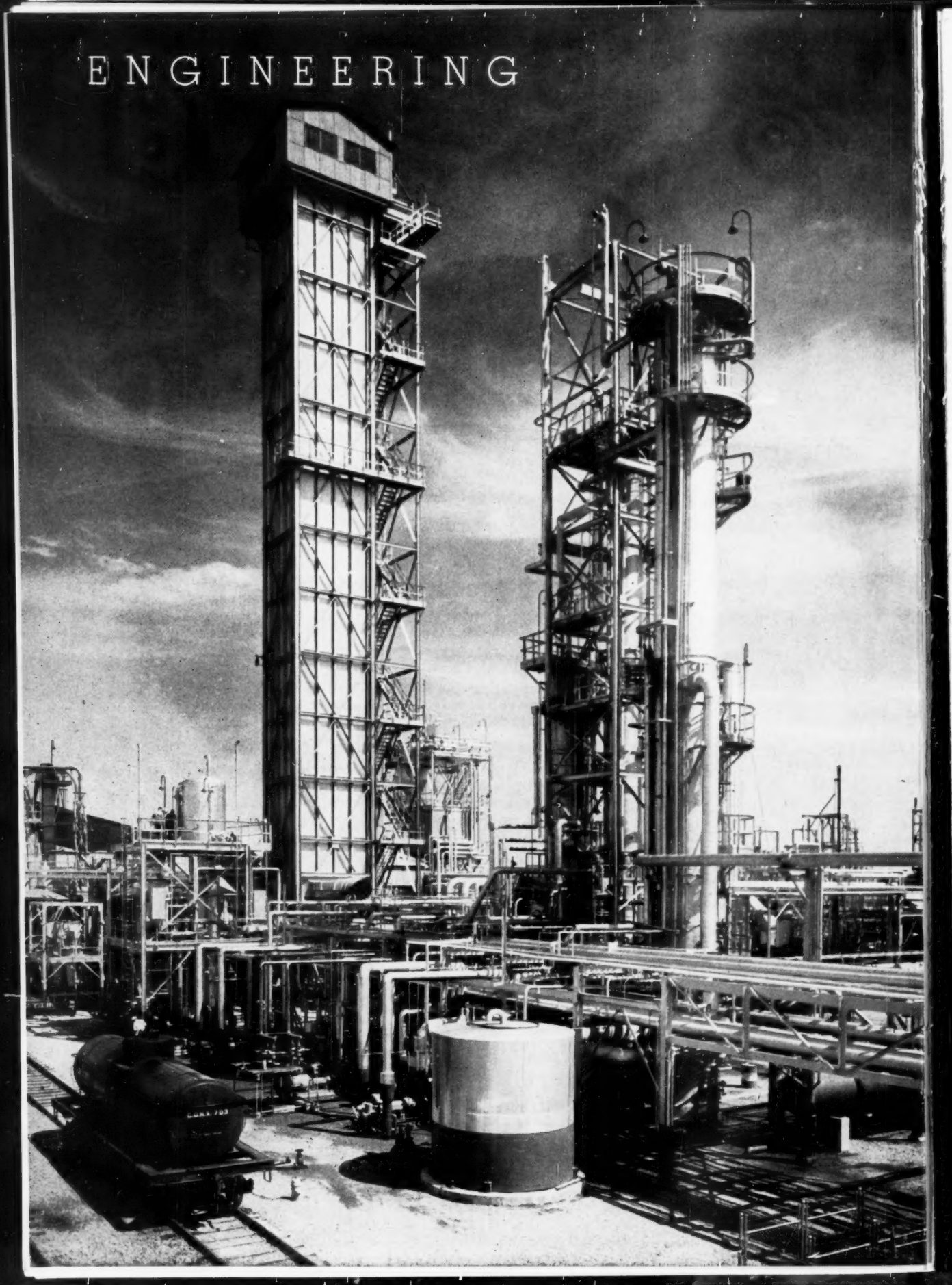
# ENGINEERING



**Urea synthesis section (right foreground) of Grace's Memphis plant will be doubled by expansion incorporating process modifications.**

# Teamwork Tames Urea Problems

**W. R. Grace & Co. this week launched an expansion project that will double the synthesis capacity of its urea plant at Memphis, Tenn. (CW Market Newsletter, Feb. 15). Although the new unit will employ the basic Pechiney process originally installed, Grace has developed a number of improvements in process technique and equipment.**

Construction of the plant will be handled entirely by Memphis contractors under Grace's supervision. Foster Wheeler Corp., contractor on the original installation is cooperating with Grace on the design and drafting of the expansion. But most of the process modifications going into the new unit are improvements resulting from a continuous three-year effort by all of the operating and service groups at the Memphis plant.

**Problem Product:** Despite the apparent simplicity of the reaction, urea synthesis is, at best, a difficult operation. It requires high temperatures (180-200 C) to produce a practical rate of reaction, high pressures (around 200 atmospheres) to keep reactants in the liquid phase. And under these conditions, the reaction mixture is highly corrosive, requires lead- or silver-lined equipment.

All of the various syntheses follow the same basic route: ammonia and carbon dioxide react in an autoclave at high pressure and temperature to form ammonium carbamate. The carbamate then decomposes at reduced pressure to yield urea, water and a mixture of unconverted ammonia and carbon dioxide. Since only about half of the ammonia is converted in a single pass through the system, economical operation requires that the unconverted gas be recycled, or converted into by-products such as ammonium sulfate or nitrate.

The method of recycling material to the autoclave is the most distinctive feature of the different urea processes (*CW, Nov. 27, '54, p. 88*). The gases can't be simply recompressed to reaction pressure because they would form solid carbamate in the compressors. Various manufacturers have different approaches to this problem.

Du Pont dissolves unconverted material in water, recycles it to the autoclave in solution. The Montecatini process employs a somewhat similar arrangement for recycling the ammonia-carbon dioxide mixture in liquid ammonia solution. Both of these methods use a large excess of ammonia to drive the reversible carbamate reaction in the desired direction. As a result, both require a separator to strip excess ammonia from the carbamate as it leaves the autoclave.

The Swiss Inventa process and the Chemico process handle the recycle problem by separating the ammonia from carbon dioxide and then recompressing them. The Inventa process does it by selectively absorbing ammonia in urea nitrate solution; Chemico, by absorbing the carbon dioxide in monoethanolamine. The latter process also employs a large excess of ammonia (three times the stoichiometric ratio), much of which is stripped out of the reaction mixture as it leaves the autoclave.

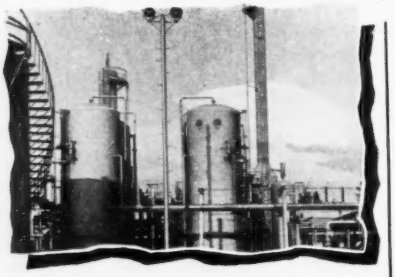
**Oil Recycle:** Unlike the other methods, which could also be operated as once-through processes, the Pechiney process was originally designed as a total recycle operation. Its distinguishing feature is the use of a neutral oil to carry unconverted carbamate slurry back into the autoclave. The oil also helps to control the process by absorbing much of the heat of the exothermic reaction. And it reduces the corrosiveness of the reaction mixture under the severe operating conditions used.

As in the other process, carbamate is formed in the autoclave, converted into urea in the decomposer. Product urea solution must then be separated from the oil carrier and filtered to remove all traces of oil. The oil is returned to a salt-oil reactor where it's mixed with the unconverted carbamate for recycling to the autoclave.

First large-scale installations of the Pechiney process were those engineered by Foster Wheeler for Grace and for John Deere & Co. at Pryor, Okla. These plants, which started up within two months of each other, were scaled up from the French company's 5-tons/day installation at St. Auban, France. Deere's 260-tons/day plant consists of two parallel processing units; Grace's plant—initially designed for 150 tons/day (exit decanter)—contains a single Pechiney reaction system.

**Eliminating the Bugs:** Startup problems at Memphis, says William Smiley, who headed the urea section of the plant, were chiefly mechanical troubles. And since the original processing system lacked installed spare equipment, extensive corrosion and erosion caused frequent failures and interruptions of urea production.

One of Grace's first corrective measures was the



# Mississippi Today

Many economic indicators point to the amazing growth of industrial expansion in Mississippi – electric power production, pulp and paper, machinery and rubber manufacturing, and finance and realty. Here are two examples, showing percentage of increase from 1939 to 1956 based on dollar volume:

**Oil and Minerals Output**

| | |
|---|---|
| *Mississippi* | *6700.0* |
| *U.S.A.* | *464.0* |

**Pulp-Paper Manufacturing**

| | |
|---|---|
| *Mississippi* | *2800.0* |
| *U.S.A.* | *419.2* |

Before locating your new **chemical plant** we cordially invite you to **KNOW MISSISSIPPI**

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installation of spare equipment. Then, to leave the operating group free to concentrate on its job of producing urea, plant manager John Carriere assigned a special team of engineers to investigate and solve mechanical operating problems. Dubbed "Task Force Urea," the group of three engineers worked under the full-time direction of Al Laehder, manager of the technological department, devoted 18 months exclusively to working the bugs out of the system.

Because of the corrosive nature of the carbamate slurry, useful life of autoclave expansion valves, used for pressure letdown of slurry from 3,000 to 60 psi., was originally measured in days. The Grace engineers made several modifications, altering the value design each time a replacement was made. Today, letdown valves commonly last for several months, and new modifications are still being tested.

**Valve Worries:** Excessive wear was also encountered on slurry-pump valves that control the flow of slurry as it is recompressed from 60 to 3,000 psi. for injection into the autoclave.

Assistant plant manager Charles Dougherty, and Herman Remmert, an engineer assigned to special mechanical problems, went to work on this difficulty, in cooperation with Wilson Snyder Co., supplier of the salt-oil pumps, and with other mud-pump makers. Using cut-and-try procedures, they discovered that meticulous attention to details of critical valve components was the key to long service life. Result: components made to Grace's exacting specifications extended useful life of slurry-pump valves from hours to weeks.

At another point in the slurry system, Grace had difficulty with valves that controlled the flow of slurry from two parallel pumps into a single line at 3,000 psi. Substitution of Annin valves—together with a specially modified, jacketed T-piece of Grace's own design—stopped the leaks and galling of these units.

Improved alloys have also played an important part in reducing or preventing corrosion failures. In a salt-oil heater, for example, repeated tube failures were eliminated by replacing the original Ampco material with a new Ampco alloy that had been developed while the problem was being studied by Grace. And a switch to a completely different type of metal for the carbamate decomposer has entirely eliminated the corrosion failures that occurred with the original stainless steel-clad vessel. (This decomposer problem, says Foster Wheeler, was unique to Grace's operation, since Deere experienced no corrosion in the decomposer and is still using the original stainless steel equipment.)

**Process Control:** Learning how to control the various stages of the tricky urea process led Grace to develop several other improvements that will be included in the expanded plant. And wherever possible, modification of processing units has been aimed at simplifying the equipment as well as improving its performance.

In the original salt-oil reactor vessel, for example, Grace found that a variation of ¼ in. in the level of the oil seriously upset the over-all balance of the process. But the operation couldn't be monitored satisfactorily either by the conventional types of level indicators or by an indirect method based on the current loading of motors used to drive semisubmerged discs in the oil. To simplify this operation, the company is currently piloting a major modification of the reactor that will be less critical to maintain and operate.

Other process control measures that have become important aids are the analytical procedures and quality-control recording system worked out by chemical control and research group manager Tom Giachino and his assistant, Don Green. Up-to-the-minute reports on the products are plotted continuously on a month-by-days graph and displayed conspicuously on a quality-control board. Operating personnel can tell at a glance just how the process is doing, can spot trends toward abnormal operation before troubles develop.

**New Units:** Besides the duplicate processing units in the plant expansion, Grace will add some new components to the system. Aimed primarily at increasing the over-all efficiency of the plant and at improving the urea quality, the new units are designed to handle the total output of both old and new facilities.

First of the new units is an ammonia recovery system, due onstream in about two months. The recovery operation will serve the dual purpose of providing additional stream pollu-

# CYQUEST 40*

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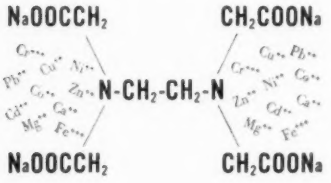
Too often, product quality is affected by troublesome metal ion contaminants that spoil color, cause turbidity, catalyze degradation reactions and make a general nuisance of themselves—even when their presence is measured in parts per million. CYQUEST 40 seeks out these di- and tri-valent ions and ties them up securely as soluble chelates that are exceptionally stable. So stable, in fact, that you can forget about these metal ions and the problems they cause – through processing, packaging, shipping and product application. In short, you can forget them altogether.

### What, Exactly, Is CYQUEST 40?

The answer is given quite completely in a data sheet (see coupon offer below) that details properties, solubilities, and the sequestering characteristics of CYQUEST 40. Here, we will just say that it is a 40% aqueous solution of the tetrasodium salt of ethylenediamine tetraacetic acid. This clear solution is completely stable under storage conditions and is not decomposed by acid




or alkali, even at elevated temperatures. In fact it takes strong oxidizing reagents such as permanganate or dichromate to even make a dent in its sturdy molecular structure.

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CYQUEST 40, as sold, is a basic solution – but we don't consider that to be very exciting news. What is important is that Cyanamid is basic in the production of tetrasodium ethylenediamine tetraacetate. As a result, no matter what your present or future requirement may be, you can rely on Cyanamid for continuous supply and prompt customer service.

Like the giant who could find his foes in the dark, CYQUEST 40 will find those multivalent metal ions – and fix them for good. Fi+++, Fo+++, Fum+++, our imaginary ions, would be ably taken care of by CYQUEST 40, for that's the nature of the beast. Maybe you can think of these as being the not-so-imaginary metallic ions that are sabotaging your product quality. A little CYQUEST 40 will do the giant-killing trick and your product can live happily ever after!

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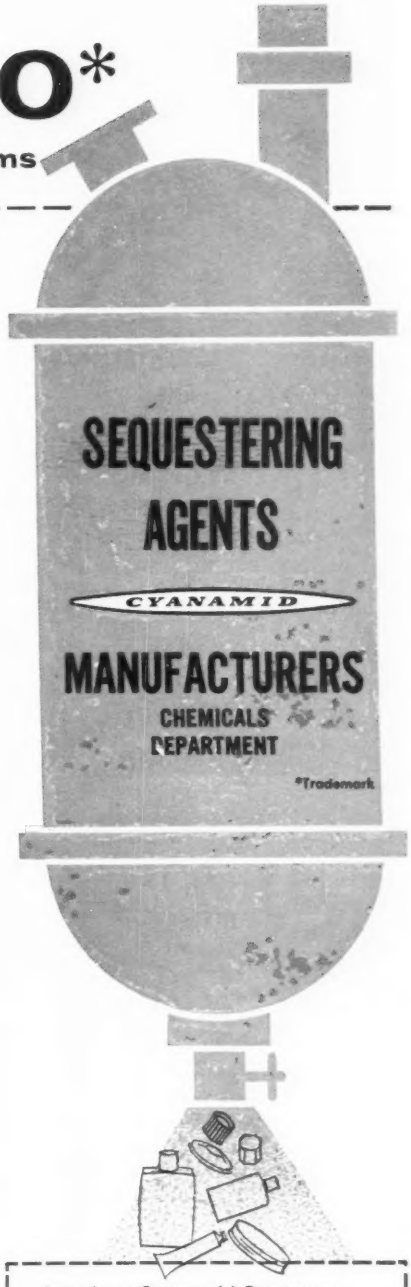
Then send for the data sheet or a sample by sending us the coupon below. Orders for drums will, of course, be gratefully accepted, too! In any case, you can count on our laboratory people and field men to offer all the help they can in the application of sequestering techniques to your product or process problems.

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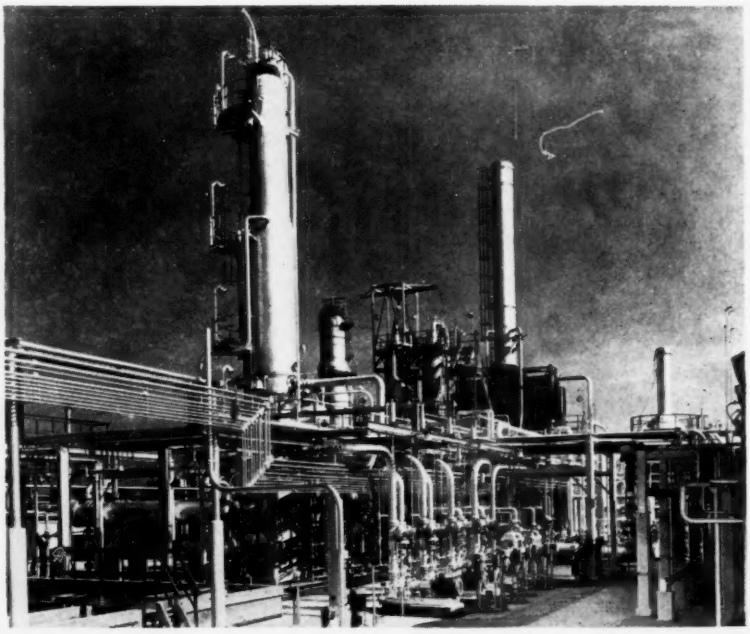
tion control and a saving of about 10 tons/day of ammonia.

Another basic change in the urea recovery and purification section of the plant is the replacement of the old decanter unit by a completely new method of separating urea solution from the oil. And for final cleanup of urea, Grace will replace its present filters with a filtration unit it developed with the assistance of Pittsburgh Coke & Chemical Co. The new filtration equipment has been piloted for about one year, is scheduled to go into the production operation next month.

**Product Improvement:** Though urea finishing operations are simpler than those employed in the reaction section of the plant, Grace soon found that it had much to learn about the prilling and crystallizing of urea. For example, prilling equipment, based on designs for ammonium nitrate prilling units, didn't perform as expected. And evaporation equipment intended to concentrate the urea solution for either crystallization or prilling could not handle both finishing operations simultaneously.

Grace solved the latter problem by adding a Rodney Hunt evaporator to concentrate 85% urea solution in the original evaporator to 99% for prilling. The technological engineering group has also developed a new evaporator that reduces the formation of undesirable biuret by shortening the



## Streamlined Desulfurizing Onstream

**This new desulfurization unit,** designed and constructed by The M. W. Kellogg Co. for Compagnie Francaise de Raffinage's Provence Refinery (Martigues, France), employs a unique method of separating reactor effluent. It is said to provide several advantages over the conventional scheme of cooling, flashing and stripping. Key: a progressive flash and recycle gasoline absorption method that permits a higher concentration of hydrogen in the recycle gas stream. By sending combined products to the product stripper column (*left*), the unit also reduces heat-exchanger requirements, saves heat that can be used to heat the feed oil. The plant utilizes a two-reactor system for operating flexibility, removes 85% of the sulfur from 12,500 bpd. of gas oil feed, 75% from alternate feedstocks of kerosene (at 7,000 bpd.) or straight-run naphtha (at 10,000 bpd.).

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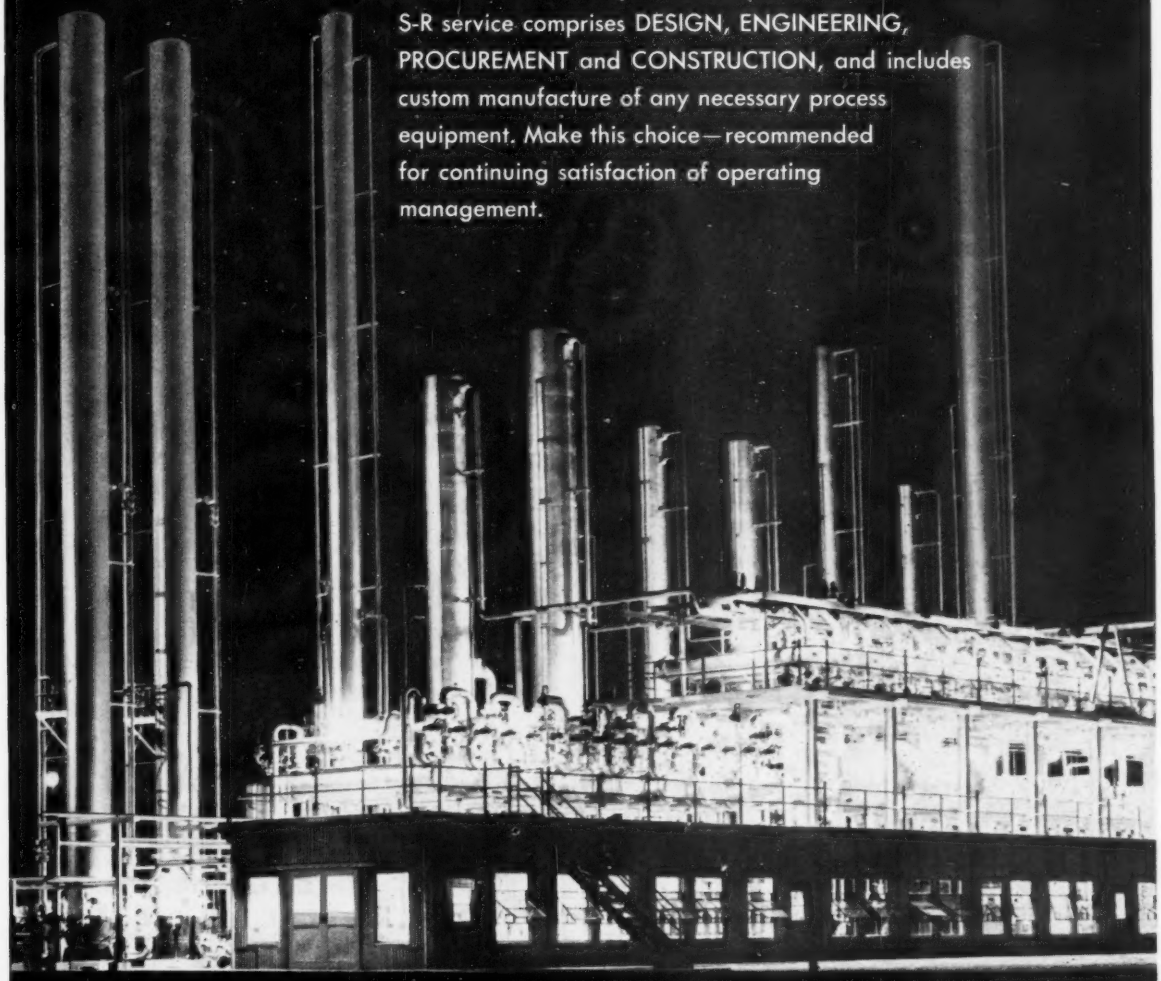
for continuing satisfaction of operating
management.



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If Service must be *Reliable*, rely on S-R.
Process Engineers for over 70 years

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THE STEARNS-ROGER MFG. CO. • DENVER, COLORADO

DENVER HOUSTON SALT LAKE CITY EL PASO
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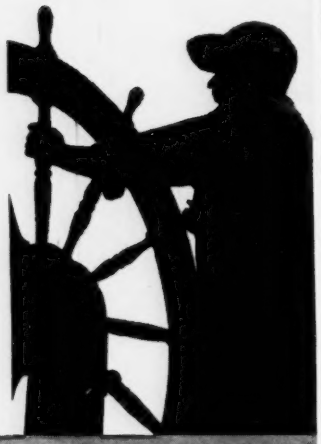
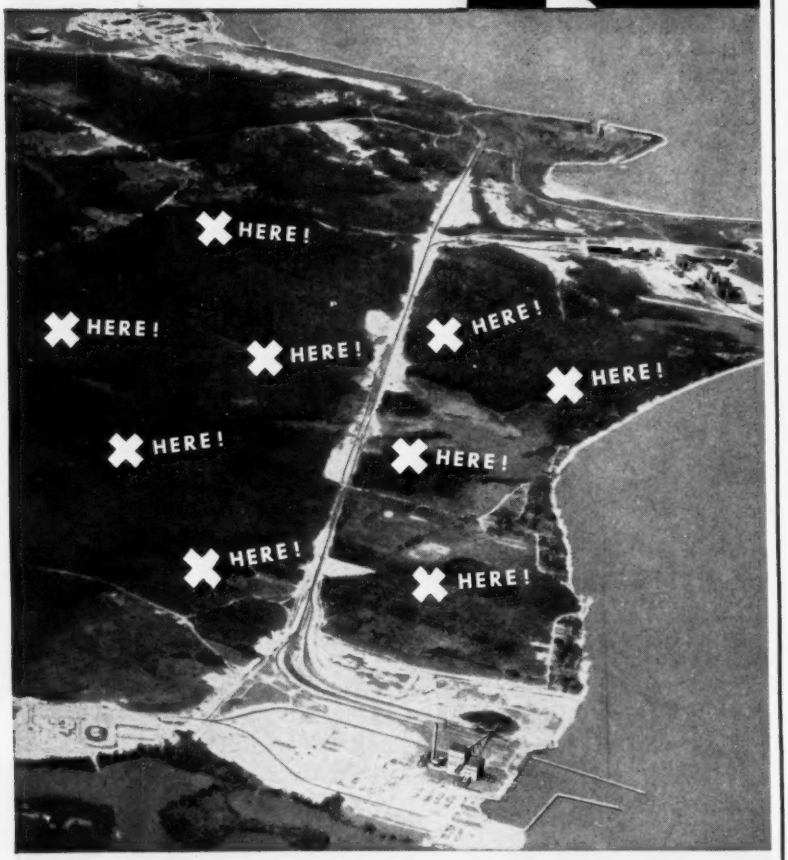
# *put to port...*

**TO FIND A "*DEEPWATER*" PLANT SITE**



... at Marley Neck, Port of Baltimore. Finest spot on the eastern seaboard ... BIG sites ... BIG labor pool ... BIG power supply ... BIG opportunities to reach U. S. and foreign markets more conveniently. A port-side plant HERE is the soundest production-for-profit strategy.

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B&O BALTIMORE & OHIO RAILROAD

*Constantly doing things—better!*




time of the first concentration step.

**Top-to-Bottom Modifications:** The prilling tower itself has been modified from top to bottom. At the top, new prilling heads have been installed to replace the original resistance-heated sparger pipes that deliver molten urea to the tower. (With the older prilling head, corrosion of the copper in electrical-resistance heating elements was a constant source of trouble.) The bottom of the tower was also completely redesigned to facilitate recovery of reject urea for recycling.

From the prilling operation, urea goes to cooling, clay blending (to coat the prills) and finally to bagging. In these operations, too, Grace has added new facilities to improve and safeguard product purity.

Latest addition in this area is a new drying unit intended to improve storage characteristics of the prilled urea. This is another example of how close cooperation between Grace's plant groups and equipment suppliers provided the best answer to a processing problem.

When Grace first contemplated the addition of a drying unit, it submitted prilled urea samples of uniform moisture content to several dryer manufacturers. Recommendations based on tests at the manufacturers' plants, however, appeared to be inconsistent with drying practice at other similar installations. The equipment suppliers then brought pilot-scale drying units right into the plant, soon determined that the required dryer would have to be almost twice as large as originally estimated. Result: a 10-ft. diameter, 70-ft.-long Standard Steel dryer is being installed to handle the total ouput of Grace's expanded plant.

For final control of product quality, the company has adopted a continuous, automatic sampling system that samples material as it flows into the bags. Laboratory analysis of the samples—together with long-range studies of storage effects on bagged material—provides a constant check on the properties of high-quality urea.

**Smooth Integration:** Scheduled for completion early next year, the expansion and modification of Grace's urea plant was purposely put on a long schedule to provide smooth integration of new and existing facilities. As a result, the company expects to put the new capacity onstream with few production interruptions.

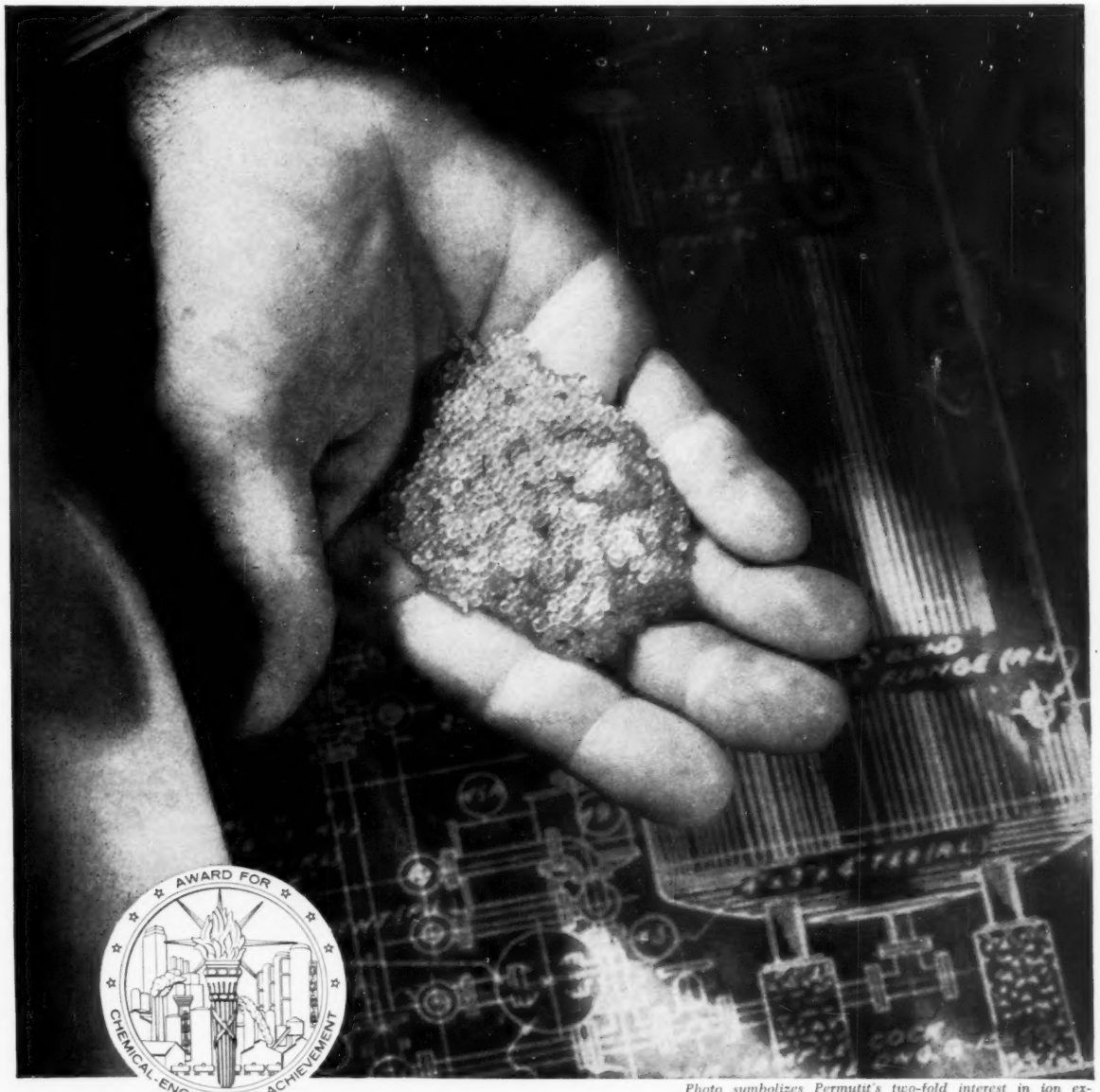


*Photo symbolizes Permutit's two-fold interest in ion exchange metallurgy: project engineering and resin technology.*

# Pioneering in ion exchange metallurgy

• **The first five** ion exchange plants for extracting uranium on a production basis were designed by Permutit engineers. The first of these has been producing uranium since October, 1952. All of these pioneer ion exchange plants—and many other large Permutit-designed installations in South Africa, Belgian Congo and Canada—are producing at high efficiency.

**Six out of seven** of the top-producing U. S. uranium mills using the resin-in-pulp process now depend on Permutit SKB ion exchange resin. Permutit SKB provides high uranium capacity and efficient recovery under production conditions. It was developed by Permutit resin research especially for uranium extraction.

This record shows that Permutit is in ion exchange metallurgy "with both feet" . . . in both process engineering and resin chemistry. And Permutit's research program in this field promises important new developments on both fronts.

The Permutit Company, Dept CW-2, 50 West 44th St., New York 36, N. Y. and Permutit Company of Canada Ltd., Toronto 1, Ontario.

**PERMUTIT®**
*rhymes with "compute it"*
a division of PFAUDLER PERMUTIT INC.
Water Conditioning
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# One less variable . . .

# with "Cellosize" hydroxyethyl cellulose

## . . . . . IN YOUR LATEX

As a protective colloid in emulsion polymerization, CELLOSIZE WP-09 or WP-300 gives excellent, water-resistant latex films. Also, the latexes are stable to electrolytes and give good shelf life and mechanical stability.

As a thickener, CELLOSIZE WP-4400 goes into solution easily and quickly at room temperatures, helps give the finished paint clean, bright colors, and improved scrub resistance.

*Remember* CELLOSIZE *HEC is the only water soluble gum used to make the base latex and to thicken latex paints.*

Let us tell you how CELLOSIZE HEC can eliminate variables in your base latex or latex paint. Write Union Carbide Chemicals Company, Room 328, Department HA, 30 East 42nd Street, New York 17, New York. In Canada: Carbide Chemicals Company, Division of Union Carbide Canada Limited, Montreal.

*"Cellosize" and "Union Carbide" are registered trade-marks of Union Carbide Corporation.*

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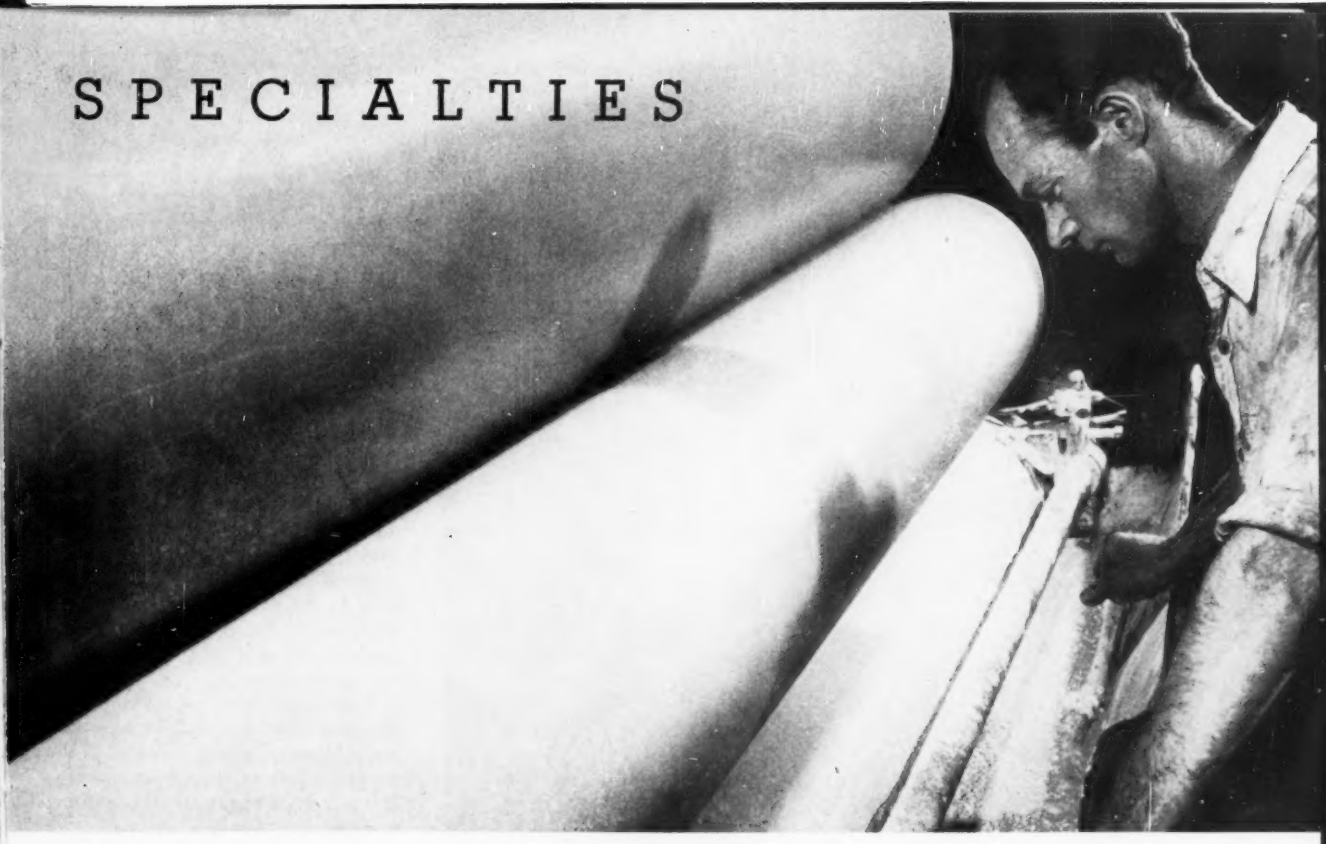


Paper manufacturers have new starch derivatives to use in surface coating.

# Paper Mills Roll with New Starch Sizings

**At this week's meeting of the Technical Assn. of the Pulp and Paper Industry at New York's Hotel Commodore, technical men got a look at specialty starches that may make significant changes in the paper industry. They were National Starch's Kofilms, a group of low-cost acetylated starch derivatives for surface sizing and coating.**

The low price (8.7¢/lb.) on the new Kofilms caused the most stir. The composition of the material isn't novel. In fact, the idea of acetylated starch goes back some 60 years, and National Starch has held a patent on an acetylating process since '49. But at 8.7¢/lb., the material is for the first time competitive with other starch derivatives, e.g., oxidized and ether starches (which sell in that same price range) now used by the paper industry.

The 8.7¢/lb. tag is about half the price that could have been asked if the Kofilms were being made strictly by the method outlined in the company's '49 patent (U.S. 2,461,139). These commercial starch-form acetylates are the first volume starch derivatives for surface applications offered since Penick & Ford brought out its Pen-Ford Gums—ethylene oxide ether starches—in the early '50s.

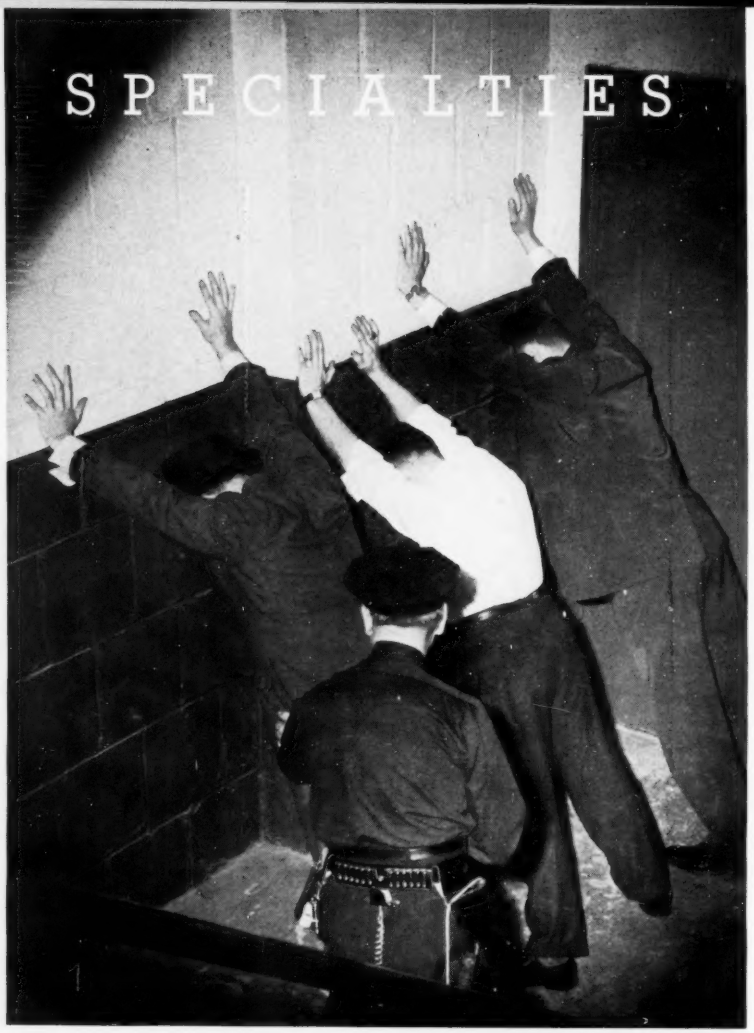
**Closer Look:** Specifically, the derivatives are substituted starch acetate esters containing enough acetyl groups to stabilize the linear amylose fraction of starch, yet not enough to destroy the desirable film toughness and flexibility associated with amylose. Films of these derivatives are characterized by strength, resistance to oil and grease and flexibility superior to the commonly used oxidized starches. They are virtually viscostatic with relation to time, which, National says, allows greater ease of material handling, reproducible formulation and improved quality control.

Films made with the acetylated starches, says National, won't craze or crack, and they qualify the treated paper for any type of printing process, including offset, where the use of heavy tack inks calls for high "pick" strength. Grease and wax holdout are also said to be substantially improved, while water resistance is about the same as for other starch forms.

Initially, the derivatives will sell in five viscosity grades, i.e., in fluidity ranges of 10, 20, 50 and 80 for surface sizing, and 80 and 90 for coating. (This makes it roughly competitive with Penick & Ford's 200 series of ethylene oxide starch ethers.)

Trying to gauge the future of the acetylated starch derivatives in the paper field is difficult right now—but the firm is convinced the outlook is bright. National thinks the product will become the biggest-selling item in its specialty starch line. Starch derivatives now account for about 50 million lbs. of the 861 million lbs. of corn starches used in the paper industry (including 216 million lbs. used in laminating and corrugating). National thinks that the 50 million figure will be tripled in the next five years.

Besides its use in the coating and sizing of paper, the Kofilms, National thinks, appear to have promising applications in the leather and textile manufacturing fields.



Heroin from these peddlers will be analyzed as part of trial evidence.

# How to Sell

**Last week in Louisville, Ky., Kenneth Richard Boyd was sentenced to five years in prison for safe-breaking. The convicting evidence in his trial: the FBI's chemical analysis of the paint found on Boyd's shoes showed it to be identical in composition and color to that on the safe.**

Boyd's case is far from unique. Each year, chemistry gives crime fighters—both in the lab and on the police beat—help in tracking down lawbreakers. Supplying the chemicals used in this work can be a profitable undertaking for any specialties maker —if he can meet the standards and the competition.

. Biggest markets for chemicals used in crime detection and apprehension are obviously those created by the routine needs of police. Crime labs are a specialized and small-volume business.

Supplying the routine requirements of the nation's 350,000 police runs into big figures. Here, for example, are some of the materials New York City buys for its police force through the city purchasing system (figures are approximate):

- $1,000/year for tear gas (hand grenade form).

Detective Margaret Grafton, crime chemist Clark, check data in New York Police Lab.

Nitric acid helps classify narcotics. New York chemists run 700 narcotic tests monthly.

C W PHOTOS—LIONEL CRAWFORD

# Crime-Fighting Chemicals to Cities

• 3.5 million gal./year of gasoline to keep more than 1,000 police vehicles moving (average price per gallon: 13¢, tax exempt): 122,000 gal./-year of lubricating oils; 3,500 gal./-year of ethylene glycol antifreeze (price/gallon: $1.499).

• $500/year for acetylene and $1,700/year for oxygen.

• $2 million/year for all inks, fingerprinting supplies and stationary items. (Actual police breakdown is unavailable.)

• $1 million/year for photographic supplies and equipment. Of this amount the crime lab uses about $1,000 worth of photographic chemicals yearly.

• $4,200/year for chemical reagents for criminal investigations.

• $216,000/year for ammunition. (Averaging $47/1,000 rounds of ammunition—mostly 38-caliber shells.)

• About 60 bulletproof vests.

**How They Buy:** Although New York City buys the greatest volume of crime-fighting materials of all U.S. cities, purchasing procedures are about the same everywhere. Whether it's New York, Chicago or Los Angeles, police chemicals are purchased through city purchasing agents on bid.

After a request for material to replenish depleted supplies is made, the city purchasing agent sends a list of needs to jobbers for bids. (Cities buy almost exclusively through jobbers and distributors.) The purchasing agent must then, under city ordinance, award the contract to the lowest bidder for equivalent chemicals.

New York publishes the quotation request (bid request) in the *City Record* for two weeks for amounts greater than $2,500. Items from $300-$2,500 are posted in the city bid room of the Municipal Building. For bids less than $300, the city's chemical buyer, Maurice Moore, "contacts jobbers known for their low prices."

Although several city purchasing managers told *CW* that they are anxious for competition, they're not in dire need of suppliers. It's not unusual for a city to receive as many as 20 bids on a single item. Joe V. Spagner, New York's purchasing manager, tells CW: "Our suppliers must be well-established customers. We want nothing to do with fly-by-night outfits. The company must meet delivery dates and product specifications, and afford the proper service. Our primary interest is quality; secondary is price."

Quality products are important to municipal purchasing agents, comments Spagner: "We won't buy any inferior product just because it's the only one available. If the product is not up to par, we'll send it right back to the manufacturer. Usually, we can find another company to make it for us. If we can't get what we want we'll make it ourselves. We set our own standards."

Though competition is stiff, from a quality-product standpoint, price isn't overlooked altogether. Frequently, a price difference of one-tenth of a cent will be the deciding factor in awarding a contract. The large law enforcement agencies can buy at low prices, since they buy in large quantities. Their purchases are exempt from taxes, and they can demand direct delivery.

**Wrong Approach:** A specialty company selling police chemicals won't get very far by flooding the purchasing department with free samples and literature. It takes a personal interview to convince most buyers. Maurice Moore, New York's chemical buyer, says that "salesmen flock into the chemical department in droves." Moore sees an average of 30 new

**When wet lab analytical procedures fail, X-ray diffraction studies determine composition.**

**Research is under way to perfect paper chromatography to separate narcotics.**

Another example of

CHEMICAL PROGRESS

# NEW SILICONE RUBBER CURES AT ROOM TEMPERATURE;

## protects jet aircraft against extreme heat

Working in a field they pioneered, G-E silicone chemists have developed a new type of silicone rubber that cures at room temperature within two minutes or in up to 48 hours if necessary.

The unusual temperature stability of G-E RTV (room-temperature vulcanizing) Silicone Rubber (—70° to 500°F.) makes it ideal for in-place sealing and caulking in high-altitude aircraft and for "potting" electronic assemblies to prevent displacement and vibration. Its phenomenal dimensional accuracy has led to its use in taking dental impressions and making molds for low-cost tooling. Impressions made with it, in atomic laboratory studies of "hot" material, record with extreme accuracy minute dimensional changes and surface imperfections caused by irradiation.

For data on new G-E RTV Silicone Rubber, write Dept. SPD, CHEMICAL and METALLURGICAL DIVISION, General Electric Company, Waterford, N. Y.

*Progress Is Our Most Important Product*

GENERAL ELECTRIC

SILICONES • PHENOLICS • LEXAN® • POLYCARBONATE RESINS • MOLDED PLASTICS • ELECTRICAL INSULATING MATERIALS • DECORATIVE AND INDUSTRIAL LAMINATES

salesmen each week, is a long-time expert (he's been buying New York's chemicals for 21 years) at spotting the responsible salesman.

Throughout the U.S., the bulk of police chemicals and supplies are purchased quarterly. Stock items (sodium hydroxide, acids, solvents) are delivered direct from the manufacturer, are stored in city warehouses—drawn out by police chemists as they're needed. Specialty items, such as spectrographic and fingerprint powders, are shipped directly to the crime labs.

**Where They're Used:** Crime labs, although not large users of chemicals, run through thousands of analytical tests* each year.

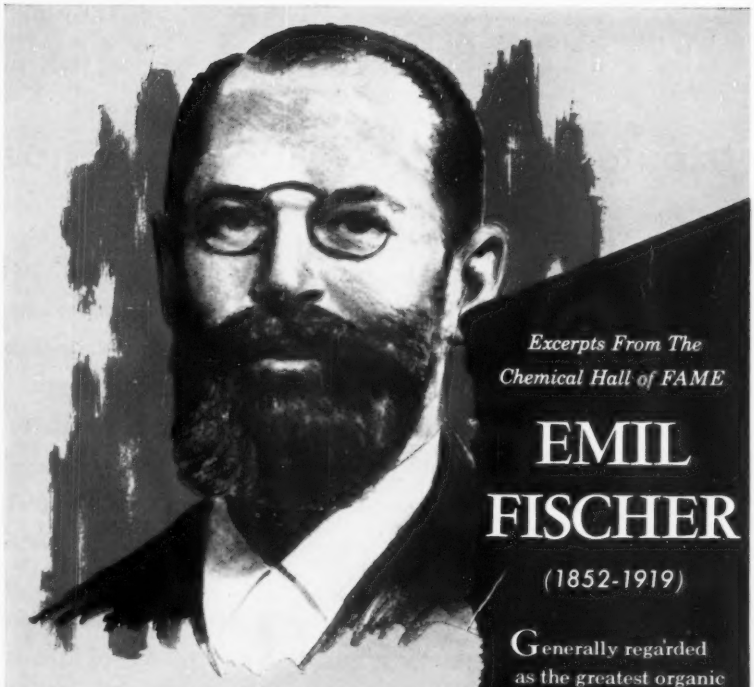
Annually, in the largest municipal police lab in the U.S., New York's crime chemists run about 7,000 cases on suspected narcotics, 2,200 cases on drunken drivers, and develop more than 7,500 fingerprint negatives. Narcotic examinations (mainly on heroin, codeine, marijuana) and liquor analysis account for over 70% of the lab's casework. About 150 cases of illegal liquor such as "King Kong," (water plus 33-40% alcohol) and "Sneaky Pete" (Port wine and sherry) are analyzed each month. Analyses and examinations of blood, documents, poison and barbiturates, are also important functions of the lab.

Helping reduce the volume of chemicals used for each investigation in police labs is the trend toward instrumentation. Spectrographs are used in the examination of poisons, soils, paints and many other items. New York alone has about $250,000 worth of equipment in its police lab. Various spectrometers, X-ray units, ultraviolet lamps and electron microscopes are only a few of the instruments used in everyday criminal analyses.

Police labs have originated several analytic techniques. Currently, research is under-way in Los Angeles' police labs in the use of electrophoresis for the isolation of fractions for blood grouping. And there's research being done in vapor-phase chromatography for ink and alcohol analysis. New York lab researchers are now working on paper chromatography for the separation of narcotics.

**Growing Market:** Although police

*Laboratory examinations conducted by the FBI, which has the world's largest crime lab, totaled 142,627 for '56—an increase of 6.7% over '55. Chicago police chemists handle more than 3,000 cases yearly. New York's police lab rates second in crime lab facilities, worked on more than 9,000 cases in '57, compared with 8,600 in '56.

*Excerpts From The Chemical Hall of FAME*

EMIL FISCHER

*(1852-1919)*

Generally regarded as the greatest organic chemist of his time, Emil Fischer was awarded the Nobel Prize in 1902 for his outstanding researches in the structures of the sugar and purine groups.

By 1902 Foremost's El Dorado Division had completed 10 years of outstanding service to American Industry as a supplier of coconut oil and its by-products . . . products of outstanding purity and uniformity.

**FATTY ACIDS** — Caprylic · Eldhyco* · Capric · Lauric · Coconut · Palmitic · Myristic

**METHYL ESTERS** — Caprylate · Eldo 18* · Caprate · Laurate · Coconate · Myristate · Caproate · Palmitate

*For Example:* **ELDO MYRISTIC ACID**

Over 95% pure. (Purest Myristic Acid commercially produced.) Available near your plant in tank cars or handy 50 pound bags. Eldo's experience and high standards give you a better, more uniform end product.

*For samples and specifications, write Dept.*

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# MULTICOLOR LACQUER ENAMEL

## contributes to the new look for Phoenix

What is happening in Phoenix is happening from coast-to-coast—everywhere architects and building managers are finding multicolor lacquer enamel the ideal finish for a variety of tough jobs. The testimonials below indicate that multicolor lacquer enamel users are not only satisfied with the results but are confirmed boosters of this product.

There are many good reasons for the enthusiastic response to multicolor. Using only normal techniques and equipment, multicolor lacquer enamel permits the simultaneous spraying of two or more colors on a surface as a single finishing coat. Concrete, plaster, canvas, wood, wallboard, various plastics and metals all can be given complete and eye-appealing coverage with multicolor lacquer enamel.

Economical to use, multicolor lacquer enamel also can be applied over irregular surfaces to mask imperfections. Unlike building materials can be merged into an attractive and serviceable area when this new coating technique is used. It's durable, too, either as the topcoat over an exterior primer, or for quick, long-lasting, dust- and mar-proof interior decorations.

Hercules Powder Company does not make finished lacquers or coatings of any kind. If, however, you have difficulty securing adequate information on multicolor lacquer enamels, write us and we will be glad to assist.

*This advertisement is one of a series prepared to explain the suitability of multicolor lacquer enamels for a wide variety of architectural applications.*

*HERCULES POWDER COMPANY*
INCORPORATED
*Cellulose Products Department · 900 Market Street, Wilmington 99, Del.*

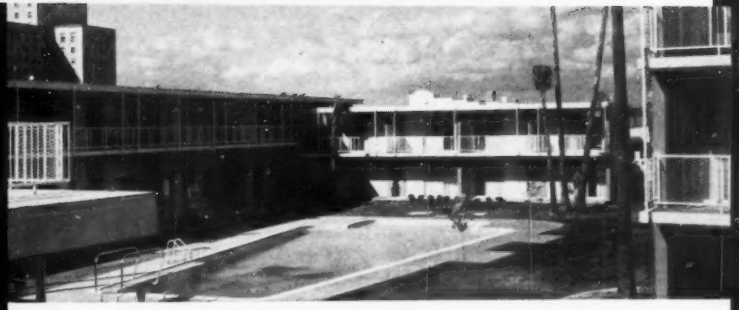
CL58-1

**CHEMICAL MATERIALS FOR INDUSTRY**

**'HOENIX TOWERS**—"The accent is on quality at Phoenix owers and to our way of thinking true quality must combine a disnctive, rich appearance with the ability to wear well. We selected ulticolor lacquer after consultation with architects, builders and ainters because it measures up to the requirements in all respects."
*Ralph W. Applegate, Applegate Realty & Investment Co.*

**HIWAY HOUSE**—"A motor hotel—especially in Arizona—must absorb a good deal of wear and tear from brilliant sunshine outside and guests and the staff inside. That's why we specified multicolor lacquer. Multicolor doesn't show marks readily, seldom needs cleaning, and always has a fresh 'just like new' appearance."
*Joe N. Simmons, Manager, Hiway House*

SPECIALTIES



**SAHARA MOTOR HOTEL**—"We are convinced that mult color lacquer is a practical wall paint. Shoe polish and scuff marks ca easily be scrubbed off the bottom area of doors. Bathroom door finishe do not deteriorate from steam and moisture. And if 'touching up' needed a freshly applied spot blends perfectly."

*John Lann, Manager, Sahara Motor Hot*

**CENTRAL PLAZA BUILDING**—"For years we attempted find a material which would withstand the wear and tear of the elemen and the other destructive treatment which attack exterior metal railin and exposed wall and ceiling areas in our patio type office building (Central Plaza Building, above, and North Central Medical Buildin below, are typical examples.) Multicolor lacquer performs so well th we are specifying it in our new two million dollar office building."

*David H. Murdock, David H. Murdock Development C*

**NORTH CENTRAL MEDICAL BUILDING**

**HOTEL WESTWARD HO**—"We started using multicolor lac quer in our rooms in 1951. Previously we had to repaint every third yea The rooms painted with multicolor in 1951, however, still retain the fresh and attractive appearance. We are sincerely great boosters c multicolor lacquer."

*Mrs. Lillian Baetigg, Executive Housekeeper, Westward H*

markets for chemicals are small, they are growing along with the crime rate. Sales of chemicals to the Los Angeles crime lab, for example, have increased 10% each year for the last six years with most of the increase in sales of chemicals used in narcotic and intoximeter blood-alcohol tests.

Increasing sales are the story abroad, too. Sales of chemicals to the Tokyo police lab were up 15% from '56, tripled in the last 10 years in terms of quantity.

New York, however, hasn't shown the purchase growth that Tokyo and Los Angeles have. New York's buyer says that he's purchasing "slightly more" chemicals now than 5 years ago.

Since 1951, the estimated number of major crimes has increased 45.7% in the U.S. which is 4 times the 11% increase in population. For the first half of '57, FBI statistics (sent in by 6,595 police chiefs and agencies in the U.S.), showed an 8.4% increase in major crimes (1,399,670 major crimes) over the same period for '56.

One thing is certain: In the future, with population growing, crime isn't likely to decrease. And the volume of chemicals used to fight crime isn't likely to decrease either.

**Faurot's Mrs. John Dondero heads a unique crime-fighting business.**

## Making Chemicals to Catch a Thief

**Faurot, Inc.** (New York), and Sirchie Finger Print Laboratories (Berlin, N. J.) find that selling chemicals for crime detection is a small but profitable business. Sirchie and Faurot are the only manufacturers specifically set up to supply police, private investigators, and government agencies with the tools of their trade. They sell an estimated $800,000 worth of equipment each year—in fingerprint equipment, thief-catching powders, ultraviolet lamps, tape recorders, moulage materials, and hundreds of other items—with Faurot doing about 75% of this business.

Although both companies got their start selling fingerprint materials, they now handle products ranging from 30¢ wax pencils to $1,200 lie detectors. Faurot sells more than 350 different products—including material for noseprinting dogs. About 600 specialties items, 400 of which are chemical products, are available from Sirchie. Frank Sirchie points out, "The only way to make money selling police supplies is to have lots of items."

In '58, he plans to market 25-30 new products. One is Search Fluorescent Bloodhound—a liquid dye visible only under ultraviolet light. It's claimed to invisibly mark a trail with a dye that can be detected on the ground by ultraviolet, even after 30 days of rugged weather conditions. It's dispensed from a spray unit on an auto.

Although improved powders and dyes are constantly being added to Sirchie's and Faurot's inventory volumes, the biggest research and development push is now for electronic devices and improved fingerprint cameras. Faurot's latest item is Police Robot #872; its advertising campaign is slated for March. And Mrs. Dondero says that two new fingerprint cameras are now in the works.

First in sales volume for both firms — and providing half of Sirchie's business—are materials for taking fingerprints — ink, rollers, holders, cards, metal slabs — and materials for obtaining latent fingerprints — powders, brushes, sensitized tape (Scotch Tape that's especially treated by Minnesota Mining & Mfg. and distributed by Faurot and Sirchie), rubber lifters and iodine fumers. Chemicals used for narcotic identification, forgery and blood analysis are rated second in sales volume.

Slowest sellers are higher-priced cameras, lie detectors, wire recorders, ultraviolet lamps and bullet comparison microscopes.

Faurot and Sirchie manufacture most of their own products, but they resell a few items (some cameras, lifting tape, microscopes, gloves). Mrs. John Dondero, Faurot president, says that the firm manufactures "well over half" of its items in its downtown New York plant. Sirchie makes about 85% of all materials, two years ago built a 12,000-sq.-ft. manufacturing plant near Philadelphia.

Biggest customers are the local police agents. Faurot distributes worldwide by 30 dealers, rates the Midwest as its biggest market area. Sirchie, with two dealers, five foreign distributors (including Canada) and one salesman, says the Eastern states (Pennsylvania, New Jersey, Virginia and Maryland) account for most of its sales. Although Sirchie is

# LOOKING FOR A GROWTH SITUATION?

*Shown here are actual production samples of stored, uncoated urea prills made by the CHEMICO process, illustrating their uniform size, shape, extreme whiteness, and free-flowing qualities.*

# UREA

Over 3500 tons per day . . . and still mushrooming! That's the story of urea, one of the fastest growing chemicals in the feed, fertilizer and raw plastics fields. With its high nitrogen content, urea gives more plant food value per ton with lower handling costs. In the plastics industry, urea-formaldehyde resins are used extensively as textile and paper treating agents, adhesives, and molding compounds.

With costs a decisive factor in the urea market, the exclusive CHEMICO process offers increased efficiency, higher yields and a product with a guaranteed 46% nitrogen content. CHEMICO also offers the only commercially available, American-developed process. Before you invest, get the details on the CHEMICO urea process.

## CHEMICO

**CHEMICAL CONSTRUCTION CORPORATION**

*A SUBSIDIARY OF ELECTRIC BOND AND SHARE COMPANY*

525 West 43rd Street, New York 36, N. Y. • Cable Address: CHEMICONST, New York

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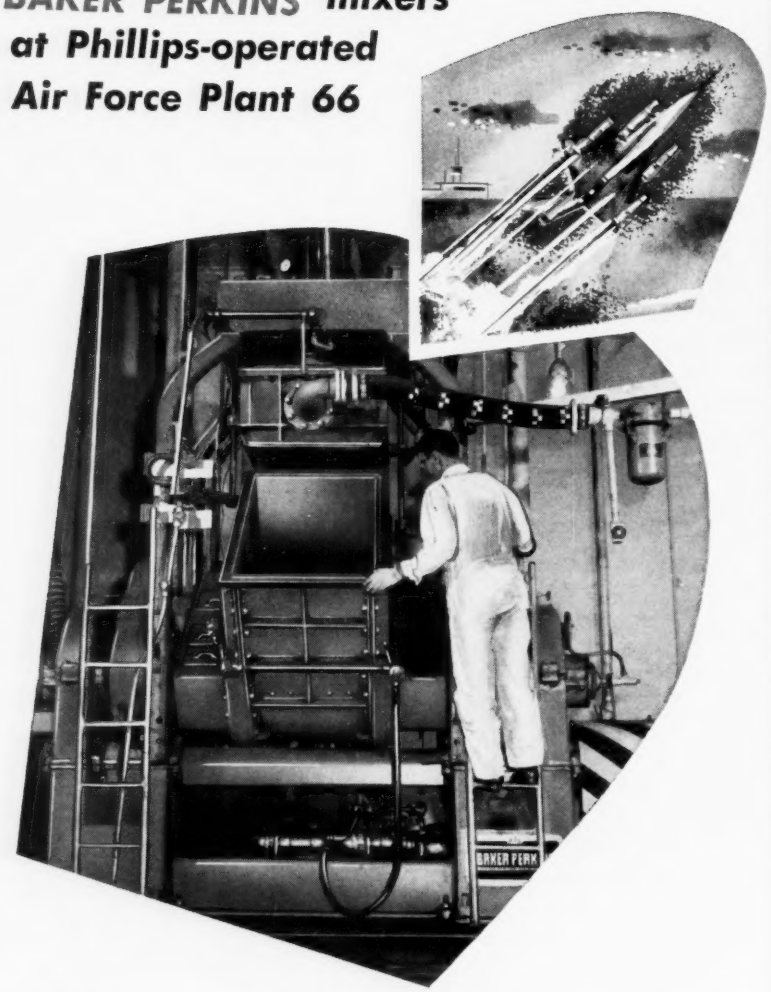
## *Jato* motor fuel is accurately blended in* BAKER PERKINS *mixers at Phillips-operated Air Force Plant 66*




Jet-assisted-takeoffs* (JATO) enable heavy aircraft to become airborne quickly and safely from limited length areas. For the precise task of mixing all-important rocket fuel used in these powerful JATO units, Phillips Petroleum Company, McGregor, Texas, uses dependable Baker Perkins Size 15 Dispersion Mixers.

A combination of vacuum-and-compression cover effectively seals the 15 VUEM2 B-P mixer, which is completely jacketed. Each of these machines has a working capacity of 100 gallons and a total capacity of 200 gallons. The 150 hp drive motor efficiently powers these units thru hour after hour of reliable, trouble-free operation.

This is just one of the many processes to which B-P high-performance mixers are instantly applicable. Write for the complete Baker Perkins eatalog . . . or consult your experienced B-P sales engineer.

**BAKER PERKINS INC.**

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**CHEMICAL MACHINERY DIVISION • SAGINAW, MICHIGAN**


## SPECIALTIES

largely dependent on small government contracts, it services more than 10,000 different accounts in cities throughout the U.S.

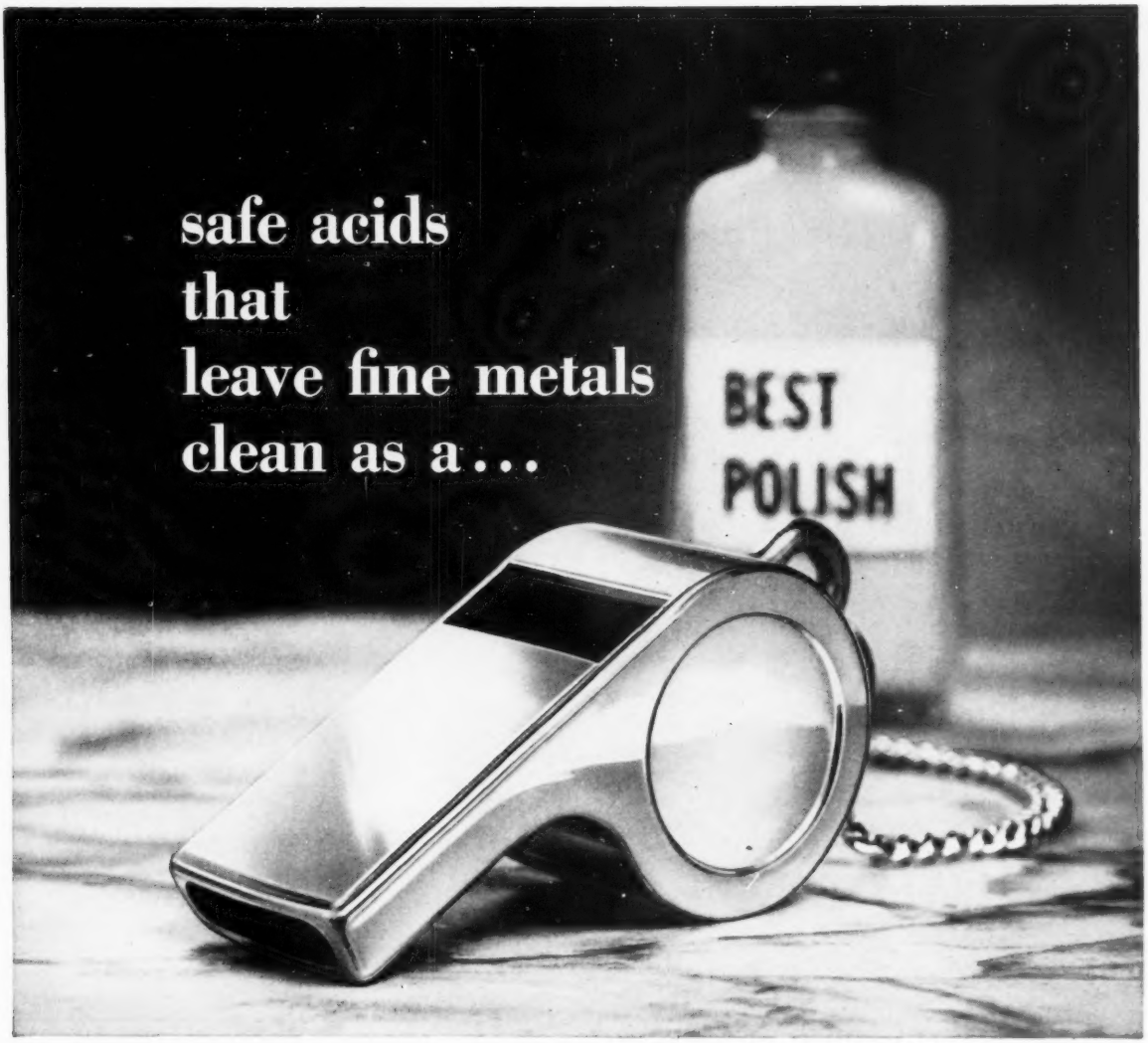
Faurot has sales other than those to law enforcers. About 500 banks use Faurot's inkless fingerprinting pad to identify illiterate bank customers. Hospitals, department stores and security plants are also big users. To make fingerprinting an easier task, the late John Dondero perfected an inkless fingerprint pad—still a secret formula of the company. It's a combination product—a special pad and sensitized paper. The pad is soaked with a colorless fluid that combines with some 22 chemicals on the paper to make a dark print. Its high cost, however, generally limits its use by police departments.

In promoting their products, Sirchie and Faurot each spend about $12,000 yearly for advertising. Faurot has a mailing list of 5,000 police agents. Sirchie sends out about 18,000 direct-mail pieces yearly to police chiefs throughout the nation. Other than direct mail, advertising is limited to trade magazines—*Law and Order, Police Chiefs* and *Police*. Faurot claims that it does most of its promoting at the eight police conventions it attends annually. About half of Sirchie's and Faurot's sales are from direct-mail orders.

The police chief rather than the city purchasing agent is the influencing force in buying the firms' police specialties items. Mrs. Dondero's selling philosophy is: "We've got to sell the police force on the uniqueness and quality of our items rather than on price. Because we're a small specialties company, our prices aren't the lowest. But we'd rather sell a small, quality volume than a large volume for lower unit profit." Markup on various items ranges from 3 to 50% —fingerprint powder usually has a 20% markup.

Making easy-to-use chemicals to help fight crime isn't a business with a high market potential. Sirchie estimates that the maximum market for his company's products is approximately $1 million/year.

Based on Faurot's 30% increase in sales volume over that of '52, Mrs. Dondero is more optimistic. She says that as police become more scientifically minded (a now-apparent trend) sales volume will soon likely grow beyond that.




# PFIZER CITRIC & TARTARIC ACIDS

● With Pfizer Citric or Tartaric Acid you can develop a household cleaning product that gets metals "clean as a whistle"—safely!

The MILD ACTION of citric and tartaric acids in your cleaning preparations effectively removes tarnish and oxides from fine silver, copper and copper alloys. Citric acid is also notably successful in solving the difficult problem of formulating an aluminum cleaner that is both safe and efficient. The mild acidity of citric acid removes oxidized coatings from aluminum surfaces with negligible attack on the virgin metal.

In addition to being safe for metals, Pfizer Citric and Tartaric Acids are NONTOXIC—an important human safety feature for your product, both in its manufacture and its use by consumers.

Pfizer offers a third nontoxic organic acid that's useful for cleaners and polishes. It is gluconic acid. Salts of gluconic acid, and of citric and tartaric acids, are available from Pfizer, too. Write Pfizer for *Technical Bulletin 61* which describes the many applications of Pfizer Organic Acids in metal cleaning, polishing and plating.

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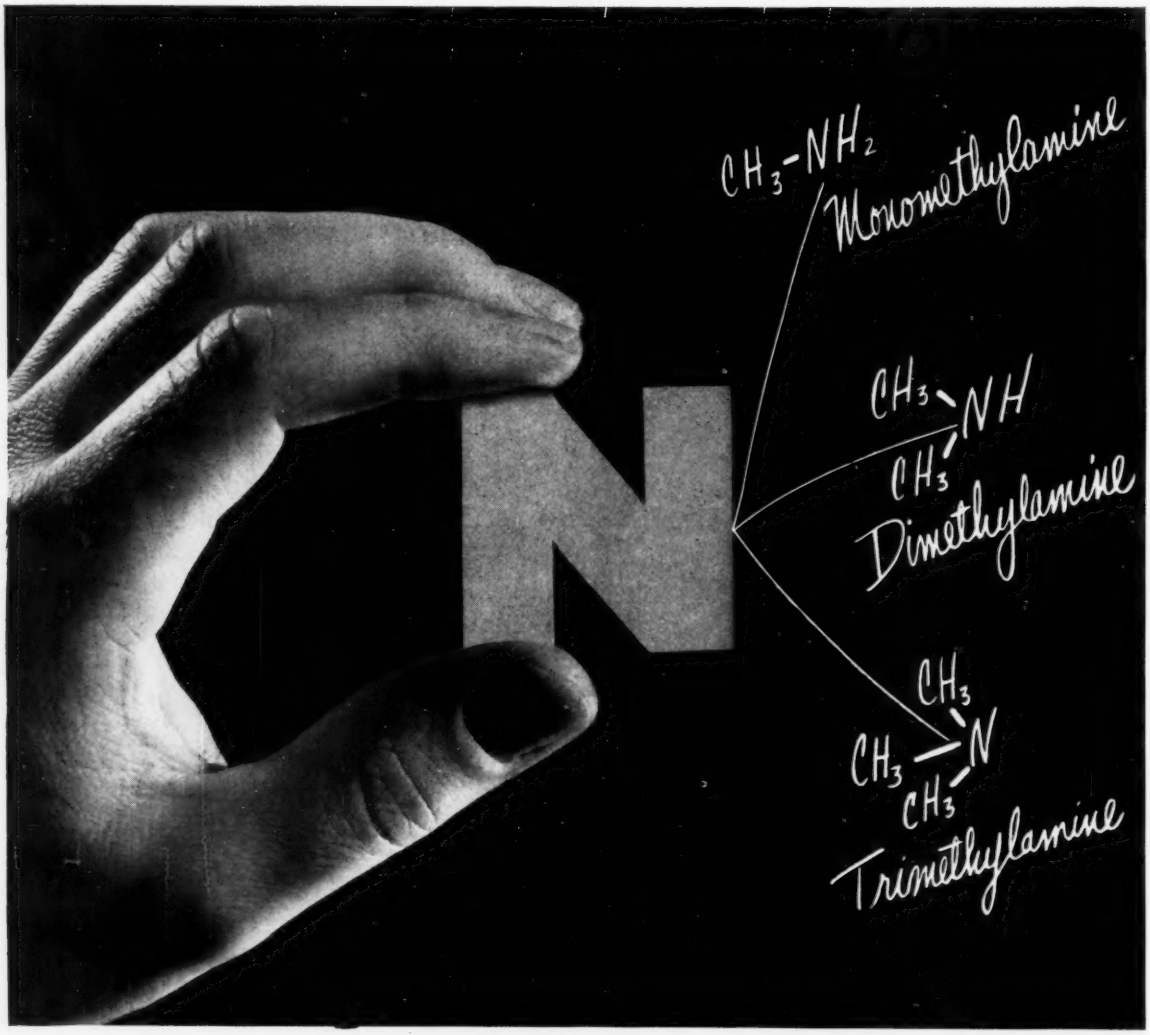


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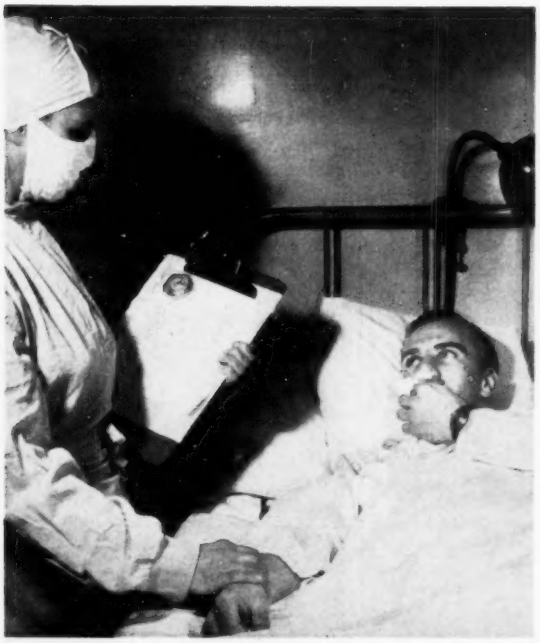
# METHYLAMINES



TB patient may have a shorter hospital stay.

## Anti-TB Drugs— Their Status in Therapy

**Major roles in chemotherapy** — Isoniazid, p-aminosalicylic acid (PAS), streptomycin.

**Newest promising drug** — Thioban (4-isobutoxy-4'-[2-pyridyl]thiocarbanilide).

**In varying stages of research on antitubercular activity** — viomycin, oxytetracycline, sulfones, substituted thiosemicarbazones, streptovaricin, bis(p-n-butylphenyl) thiourea, pyrazinamide, cycloserine, dihydrostreptomycin, p-hydroxypropiophenone and derivatives, B 663 (an isomeric phenazine pigment derivative), kanamycin.

# Adding to the Arsenal of anti-TB Drugs

**Hopes are running high this week that a new drug may soon help stem the ravages of tuberculosis. Preliminary reports on Thioban, as it's called by developer Parke, Davis, indicate the orally administered drug is a likely candidate for admission into the circle of clinically proved TB drugs (see table, above) on the basis of merits that investigators call "unique."**

Facts on Thioban emerged at the 17th Veterans Administration-Armed Forces Conference on the Chemotherapy of Tuberculosis, held recently at the Hotel Claridge in Memphis, Tenn.

• George Phillips, director of the Jackson County Sanatorium (Jackson, Mich.), called the drug "well tolerated when substituted for *p*-aminosalicylic acid (PAS) in multiple-drug regimens for 16 tubercular patients." He suggested that a more extensive study be made on tubercular patients.

• Guy Youmans, Northwestern University researcher who turned up the drug in a Parke, Davis screening program, reported that less than one gram of Thioban may be substituted for 12 grams of PAS. He based this dosage on studies of tubercular mice.

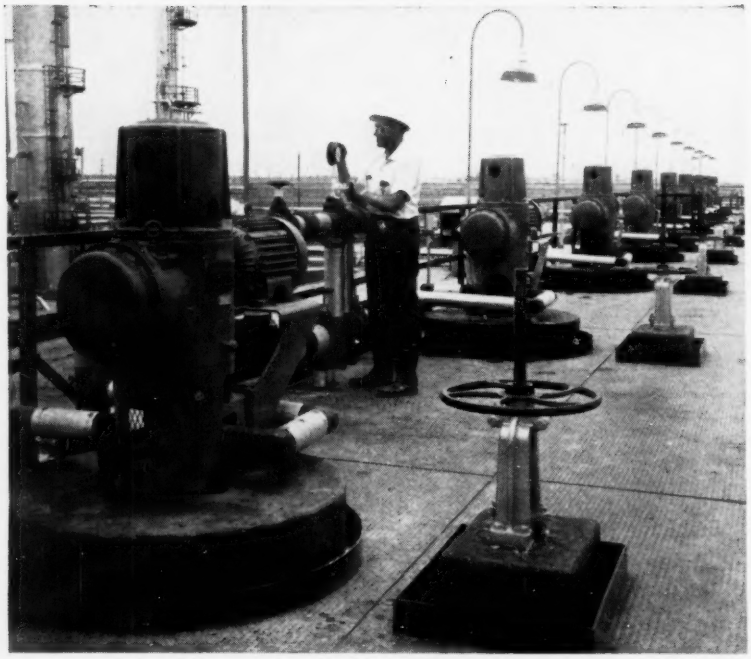
• William Steenken, Jr., director of Trudeau Laboratories (Saranac Lake, N.Y.), reported that Thioban was 10 times more active than PAS on a weight-for-weight basis in rabbit tests. Steenken observed no manifestations of toxicity.

**Welcome Addition:** If Thioban makes the grade in routine TB chemotherapy, it will have succeeded where a host of other drugs either have failed or are still trying. Isoniazid (isonicotinic acid hydrazid), PAS and streptomycin—individually or in combination —now have the field pretty much to themselves.

Gladys Hobby, noted Pfizer TB drug researcher, tells *CW*: "The chemotherapy we have is tremendously effective, but none of our drug combinations thus far has been sufficiently powerful to eradicate all of the TB bacilli from an infected host. We're shooting for improved drugs or a betterment of the efficiency of existing drugs."

New-drug researchers are aiming much of their investigations at overcoming the ability of tuberculosis germs to develop drug-resistant strains. This resistance accounts for the frequent use of the proved drugs in combination. PAS, for example, when paired with either isoniazid or streptomycin or with both, increases their effectiveness by delaying the development of resistance.

So far, success of new drugs has been limited, often because of side effects. In combination with isoniazid, pyrazinamide has worked effectively against lung TB, but the combination has caused liver damage. Viomycin (Pfizer's Viocin), kanamycin (*CW, Nov. 30, '57, p. 65*) and cycloserine —although effective in varying degrees against TB—are hampered by toxicity. Oxytetracycline (Pfizer's Terramycin) and dihydrostreptomycin (developed in an attempt to avoid streptomycin's



Orange, Texas plant, The Firestone Tire & Rubber Company

# *How to keep a solvent extraction train* **highballing**

In this butadiene solvent-extraction train, mechanical mixers were needed to provide intimate contact between the solvent and hydrocarbon phases for quick and complete recovery of butadiene.

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The answer is in the LIGHTNIN Mixers you see here.

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Best of all, seal replacement is a fast, simple, one-man job. When a seal eventually does wear out, there's no need to dismantle the mixer or take it off the tank. The seal cartridge uncouples and comes out in one piece, and a new cartridge is bolted in place, without disturbing shaft alignment.

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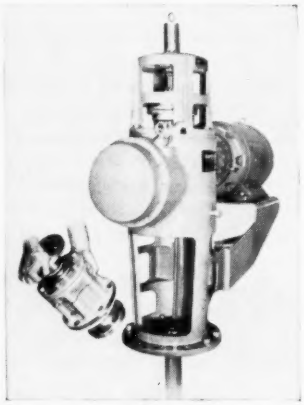

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side effects) still haven't, for one reason or another, gained full acceptance among physicians.

More recent attempts are currently being viewed with somewhat diminishing degrees of optimism. Ciba now expresses "little interest" in its bis (*p*-n-butylphenyl) thiourea, covered in U. S. Pat. 2,760,976. Originally, the company credited the compound with considerable anti-TB activity. Now, it's looking at other compounds for this purpose.

Streptovaricin (Upjohn's Dalacin), at last year's VA-Armed Forces con-

Jackson County's George Phillips: For Thioban, more extensive tests.

ference, was described as "striking" in its activity, now reportedly has lost some favor as a possible therapeutant.

There seems to be no dearth of drugs submitted to the years of testing needed to establish efficacy. Some of them: *p*-hydroxypropiophenone and derivatives, reported in France by University of Paris researchers; B 663, one of a series of isomeric phenazine pigment derivatives uncovered by researchers at Dublin's Trinity College —which theoretically acts by forming hydrogen peroxide within the bacterial cell.

Another aspirant has been isolated from cod liver oil. It's described as an unsaponifiable component of the oil. A 12-oz. supply (isolated from 50 lbs. of cod liver oil) has been supplied by British Cod Liver Oils Ltd. to the Dutch Government Nutrition Research Center at Utrecht, Holland, for

further investigation. One fraction, composed of glyceryl ethers, will reputedly kill cultures of tuberculosis germs, even when diluted to a few parts per million.

There's promise, too, that research will turn up more basic knowledge of how TB drugs work. At Philadelphia's Jefferson Medical College and at the University of Chicago, tracer studies (on animals) are following the bactericidal action of "tagged" (radioactive) TB drugs.

Meanwhile, TB vaccines are getting the increasing attention of researchers. BCG—named for French discoverers Calmette and Guerin—is widely used but does not confer complete immunity.

In the U.S., about 800,000 people have tuberculosis, either active or inactive, and are in need of medical treatment. New drugs, physicians believe, may be their major hope.

## EXPANSION

**Hastings Plastics, Inc.** (Santa Monica, Calif.), is now operating a new plastics research laboratory to handle customer product and process problems.

•

**Great Lakes Carbon Corp.** is planning a $50-million research and development center to be built on a hilltop site in Palos Verdes, Calif.

•

**Midwest Research Institute** (Kansas City, Mo.) has established a fire research laboratory. Studies will include methods of extinguishing fires, fire hazards and ways to alleviate them, design and development of fire-fighting equipment.

## PROJECTS

**Economical Electricity:** An advanced concept in nuclear reactors to produce electricity economically will be investigated for Southwest Atomic Energy Associates by Atomics International, division of North American Aviation, Inc. A new agreement between the two organizations calls for a $5,354,000, four-year research and development program to determine the economic feasibility of producing electricity in the advanced epithermal thorium reactor (AETR). The reactor would use sodium as a coolant, uranium-233 as fuel, and beryllium or graphite as a moderator. Thorium


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## RESEARCH

would serve as a "fertile" material, to be converted into uranium-233 in the "breeding" process.

•

**Japanese Nuclear Gain:** Japanese scientists climbed aboard the nuclear fusion bandwagon this week by achieving a 1-million C, 1-millionth-of-a-second reaction in experiments at the University of Osaka. According to Yasuji Fushimi, chairman of the Japan Academy of Sciences' Atomic Energy Committee, this puts Japan at about the same stage of thermonuclear research as claimed by the Soviet Union two years ago. Fushimi says its reaction was obtained using apparatus much smaller than the British Zeta and costing one-tenth as much. (The British have reported a reaction temperature of 2-5 million C.)

•

**Propellent Inspector:** A new, improved technique for X-ray inspection of charges of rocket and missile solid fuels has been developed jointly by High Voltage Engineering Co., Thiokol Chemical Corp. and the Friez Instrument Division of Bendix Aviation Corp. A small X-ray generating unit, lowered into the hollow propellent core, provides a radiographic picture on a receiver outside the charge. Undetected hidden pockets or cavities in the charge may result in uneven burning, can affect missile thrust or course, possibly burn through the missile's side, destroying it.

## PRODUCTS

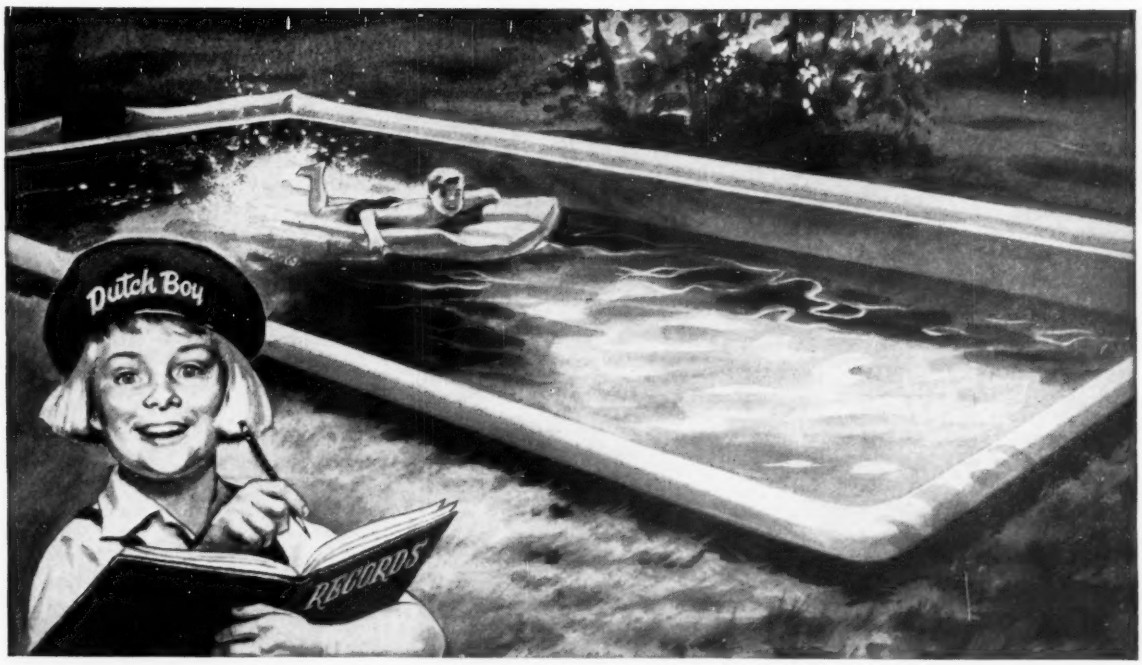
**Swiss Offer:** Epsilon-aminocaproic acid is now being produced in trial quantities by Holzverzuckerungs AG. (Zurich, Switzerland). The firm will supply samples and information.

•

**Diabetes Control:** Orinase, Upjohn's oral antidiabetic agent, is claimed to control diabetes in 78% of patients who incur the disease as adults. The results are based on a large-scale German study, recently disclosed by

# Gift Crystal Aids Scintillation Studies

**This giant lead fluoride crystal,** held by Prof. R. V. Jones, Aberdeen University (England), is his gift to the U.S. Army Engineer research and development laboratories (Fort Belvoir, Va.). It will be used in scintillation studies. (Lead fluoride features high density and clarity, is particularly suitable for studies in the transformation of nuclear energy into light.) Jones is shown with Hewell Blackburn (*left*) and Robert Beadle, lab staffers who helped develop a 32-lb. thallium chloride crystal for nuclear physics research at the California Institute of Technology (Pasadena).




**Vinyl pool liner lasts for years!** "Dutch Boy" Dyphos reduces weather damage and other types of deterioration to the vinyl plastic used in making this pool.

# Sayville research *proves* "Dutch Boy" Stabilizers reduce weather damage in vinyls

This king-size vinyl plastic swimming pool is good for years, the makers say.

It's *tough*. And weather-resistant. The "Dutch Boy" sees to that!

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From "Dutch Boy" research have come sixteen other stabilizers, including two remarkable new ones, Flomax* and Nalzin*, which combine to produce beautifully clear vinyl products. Each a specific for factors harmful to plastic products. These stabilizers improve electrical insulation, flooring, toys, flexible tubing, film, sheeting, many other products.

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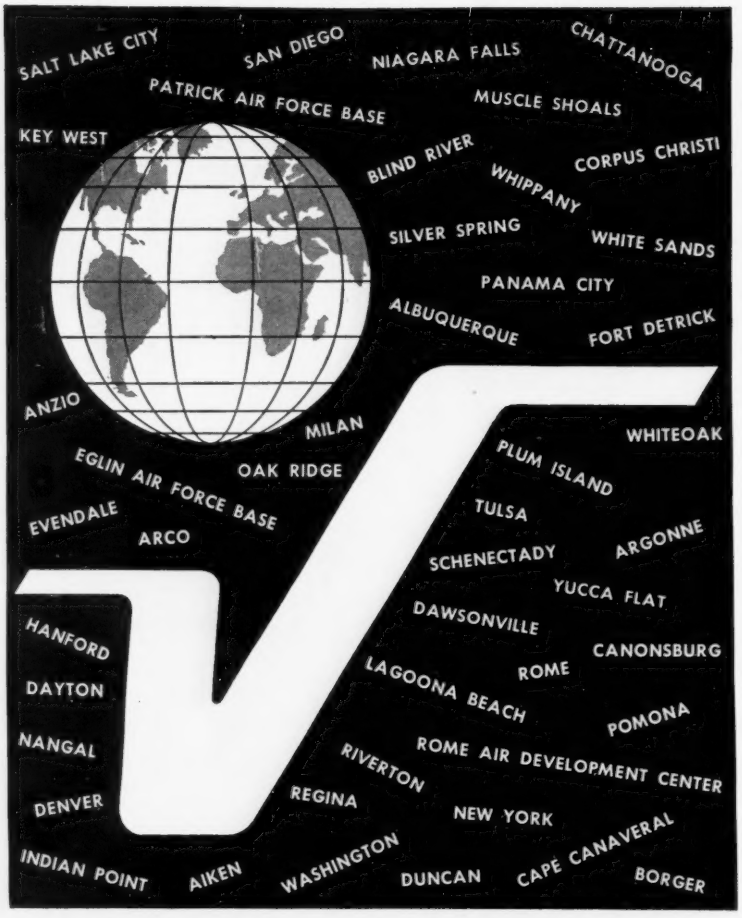


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- Ceramic colors, pigments, and chemicals

## RESEARCH

Dr. Ernst Pfeiffer, assistant professor of medicine, and chief of the diabetes clinic, University of Frankfurt.

•

**Organo silicone:** Dow Corning Corp. has developed a new epoxy silicone derivative called Syl-Kem 90, chemically 1,3-bis [3-(2,3-epoxypropoxy) propyl] tetramethyldisiloxane. Suggested uses: resins, dyes, waxes, plasticizers, light stabilizers, pharmaceuticals, oils, fungicides, and epoxy curing agents.

•

**Standard:** American Petroleum Institute, branch at Carnegie Institute of Technology (Pittsburgh), now offers standard samples of 3-ethyl-cyclopentene. Price: $50/5 ml.

•

**Phenols:** Five phenol derivatives are newly available in development quantities from Henley & Co., Inc. (New York City). They are 4-tertiarybutyl-; 2,4,6-tritertiarybutyl-; 2-methyl-4-tertiarybutyl-; 2-tertiarybutyl-4-methyl-; and 3-methyl-6-tertiarybutyl-phenol.

•

**Tagged Compounds:** Six new tritium-labeled compounds are obtainable from Tracerlab, Inc. (Waltham, Mass.). The compounds: estradial-6,7-H -17 $\beta$-acetate; methanol-H (methyl labeled); methyl-H iodide; sodium acetate-H; stearic acid-9, 10-H; and styrene. Tritiated water is also available from stock.

•

**Plastic Mix Adjuvant:** Methyl succinic anhydride, now offered by Chas. Pfizer & Co., Inc. (Brooklyn, NY.), in research quantities, reportedly lengthens the storage life of aliphatic or aromatic epoxy resin formulations.

## REPORTS

**These new reports are available** from Office of Technical Services, U.S. Dept. of Commerce, Washington 25, D.C.:

• "Development of Thermally Stable Polymeric Materials" (PB 131253, $1.75) describes attempts to polymerize diphenylvinylsilane, etc.

• Twelve Atomic Energy Commission reports concerning chemistry include: Tritium Separation Factors in the Calcium-Water Reaction (DP-217, 50¢); Sampler for Powdered Material (DP-231, 50¢); Polarographic Determination of Uranium in the Presence of Molybdenum (DP-236, 75¢); Absorption Spectra of Plutonium and

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## RESEARCH

Impurity Ions in Nitric Acid Solution (HW-44744, 75¢); Observations on the Mechanisms and Kinetics of Aqueous Aluminum Corrosion (HW-51849, $1); Determination of Boron in Aluminum-Uranium Fuel Elements (IDO-14418, 50¢); Solubility of Carbon in Sodium at Elevated Temperatures (KAPL-1807, 50¢); The Inhibition of Hydrogen Corrosion of Uranium (Y-1151, $1.25); The Isolation of Americium-241 in 100-mg. Quantities from Large Amounts of Impurities (UCRL-3934, $1); Bibliography on Uses of Radioactive and Stable Isotopes in Industry, a list of selected references (TID-3511, 75¢); Reprocessing Uranium by the deBoer Volatile Iodide Process (KAPL-1788, 75¢); Energy Transfer in Ordered and Unordered Photochemical Systems (UCRL-3942, $1).

### New Cell Prober

**Growth within living cells** can be directly observed and measured by this new kind of X-ray microscope, as shown by its developer, Howard Pattee, Jr., Stanford University physicist. Pattee is acting director of Stanford's X-ray research laboratory, where he built the device with support from the American Cancer Society and the National Institutes of Health.

Called the microfluoroscope, it passes X rays through the material being examined. The rays form a picture by activating a fluorescent screen. Previous X-ray microscopes (*CW, Nov. 17, '56, p. 112*) do not produce directly visible images, require photography for examination of specimens.

**1957 Review**
**1958 Preview**

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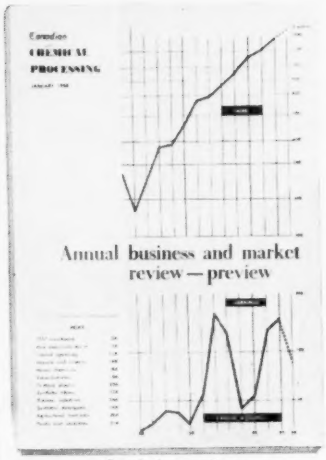


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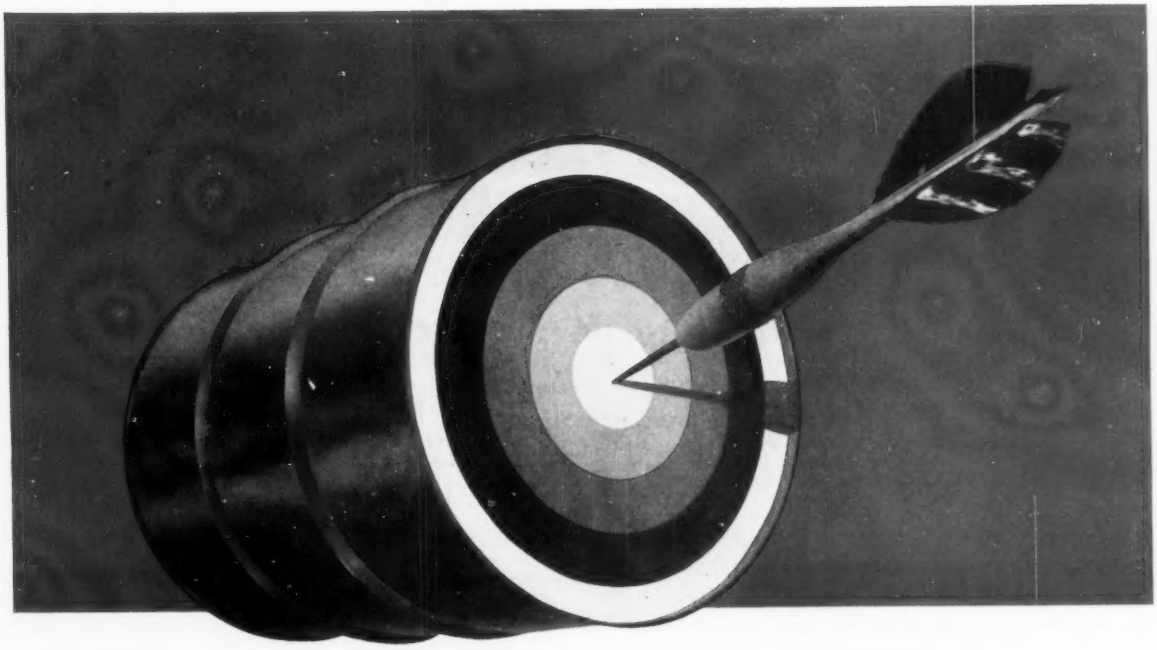

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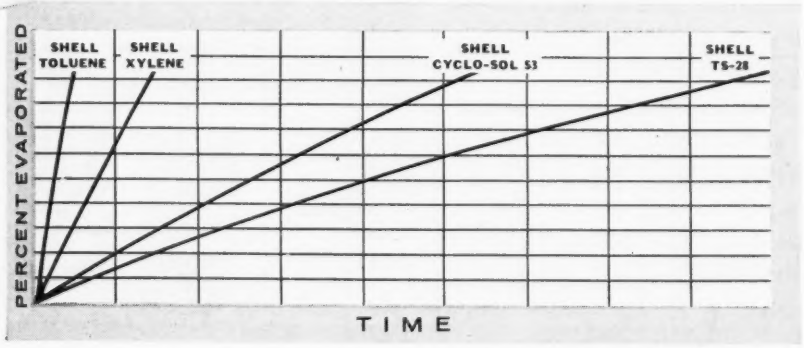


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SHELL

# Technology
## Newsletter

CHEMICAL WEEK
**February 22, 1958**

**Goodyear will commercialize its new polyester film** in a $9-million plant at Apple Grove, W.Va. Named Videne, it is now being made in limited quantities at Goodyear's facilities in Akron. Engineering studies for the big plant are being completed; full production is expected by early spring next year.

Goodyear describes the product only as a "completely new polyester laminating film." But it's quite apparent that the material is based on a mixture of dimethyl terephthalate (DMT) and dimethylisophthalate (DMI). The firm has been working on the product for some time and as early as last year was highly enthusiastic about its film progress (*CW, April 6, p. 32*).

**Specifically, the product answers to the description** of a copolymer outlined in British Patent 766,290.

Goodyear is thinking big about the potential for Videne. Among the advantages it cites: good aging and abrasion resistance, good dimensional stability and a controlled gloss factor on the finished products. Moreover, it can be laminated to a wide variety of materials (wood, metal, plastics, paper) without use of a special adhesive.

The product will be marketed in two forms: Videne A and Videne TC. The former is an unoriented film 0.002 to 0.0075 in. thick suitable for protective and decorative laminations. It can be "stretch laminated" to a thinner film. Videne TC is an oriented film aimed at packaging applications.

**The closest thing to Videne now sold is Du Pont's Mylar** terephthalate film. Each, however, has distinctive properties. For instance, Mylar requires adhesives for laminations. But Videne doesn't measure up to Mylar's heat resistance. Temperature ranges for the two: −80 to 350 F for Mylar; −40 to 220 F for Videne.

Goodyear President E. J. Thomas says construction of its big plant will set off a chain reaction of new building both by Goodyear suppliers and customers. Over-all, this expansion may amount to several millions of dollars. Among the likely customers are Alcoa, Dow, U.S. Plywood, Meyercord and General American Transportation. All have been working with the film.

Suppliers are not so apparent, however. Goodyear doesn't say where it gets its materials, but Hercules is believed to be supplying both the DMT and DMI. Although its process (used at Burlington, N.J.) can turn out both, Hercules is probably not making appreciable quantities of DMI from meta-xylene. It could, however, buy isophthalic acid from Oronite and convert it into the diester. Material for the Apple Grove plant might come from several sources such as Hercules, Oronite and Standard Oil of Indiana.

# Technology
## Newsletter

(Continued)

**Sodium-cooled reactors for submarines have been ruled out** by the Navy. This, however, doesn't mean the write-off of such reactors for land-based power sources where restrictions are nowhere near so severe.

The Navy has for some time been having a lot of trouble with the sodium-cooled reactor it has in its *Seawolf* (the second atom sub). Now, it has asked Congress for $20 million to pull the sodium reactor out and install a pressurized system similar to the one used in the *Nautilus*.

One attractive feature of a sodium reactor is that it produces higher, more efficient water temperatures with a low-pressure pumping system. But its drawbacks have offset any inherent advantages as far as the Navy is concerned. One of the biggest lies in the corrosive nature of sodium. It is likely to cause leaks that are hard to detect, hard to repair.

•

**Two novel uses for radioisotopes** have been turned up by Australians. One large chlorine manufacturer is using mercury-203 to keep tabs on the amount of mercury present in its electrolytic cells. And lignin researchers, at Australian Paper Manufacturers Ltd. (Melbourne), find that betarays from "hot" thallium kill the static electricity that makes lignin cling to their pestles and mortars. The equipment is exposed periodically to partly exhausted thallium (obtained from the plant's beta-ray thickness gauges); it then has the property of dispelling the static electricity.

•

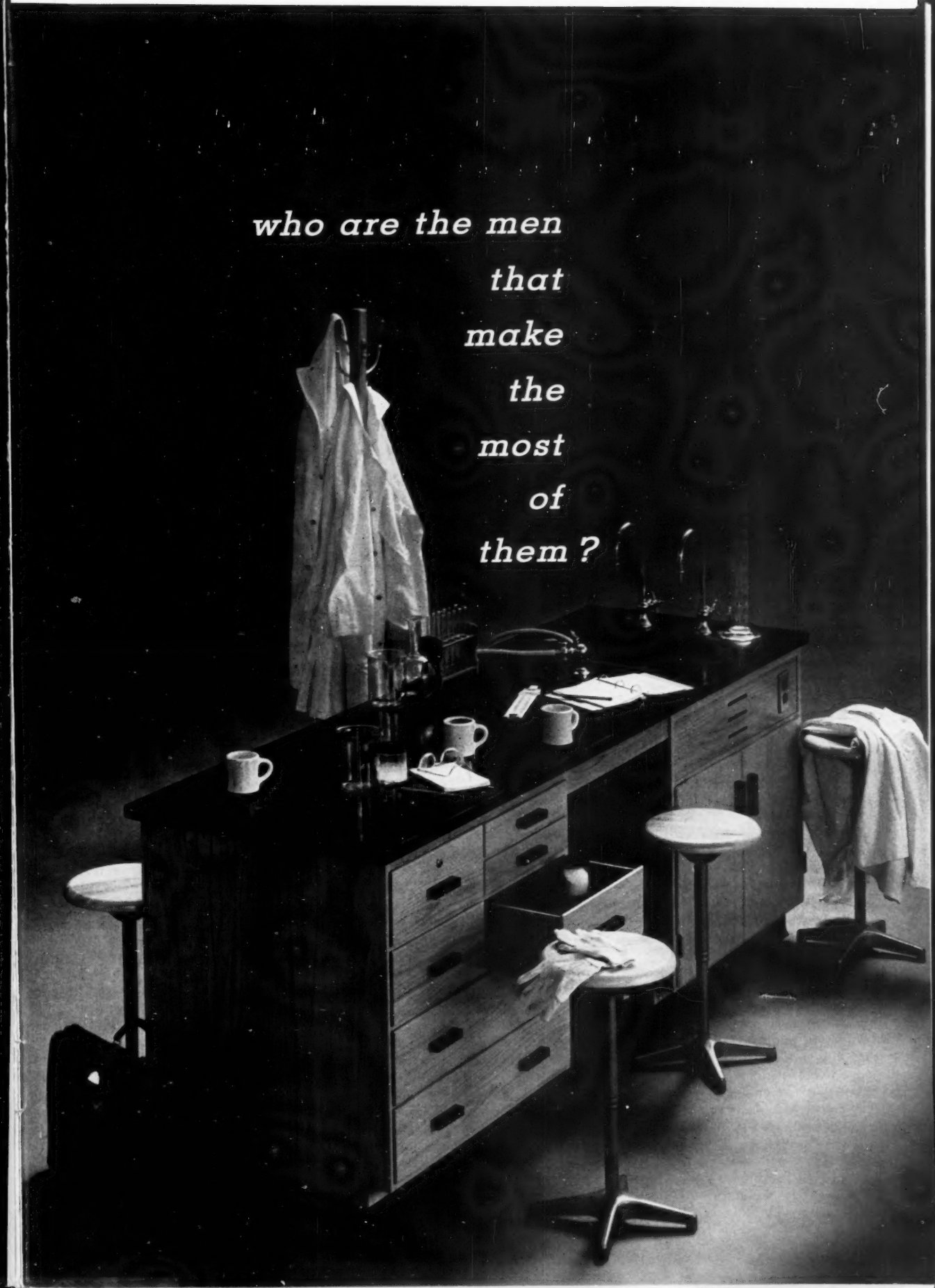
**Dow is being very cagey about its novel process to "wrap" meat** in plastic. The process is still under development, and Dow won't even name the plastic used. But observers think there could be a bright future for the technique. It involves dipping chilled meat cuts into molten plastic, quickly removing them. An unbroken tough, transparent, protective film is thereby formed on the meat.

•

**Dow is enthusiastic, though, about its gallium recovery process.** The patented process (U.S. 2,823,096) makes it possible to recover "substantial amounts" of gallium from aluminum ore. It works like this: subdivided ore is treated with a current of hydrogen chloride or hydrogen bromide under substantially anhydrous conditions at 700-950 C; gallium is volatilized as the trihalide, condensed and recovered as the pure metal. Next step: finding commercial uses for the product.

•

**Cheaper wet-strength papers on the way?** Papermakers gathered in New York this week heard of a novel process that imparts wet strength to paper and paperboard, yet uses 30-60% less melamine resin than formerly required. American Cyanamid told about the development (which uses its melamine resin) at the annual conventions of American Paper and Pulp Assn. and Technical Assn. for the Pulp and Paper Industry.


who are the men
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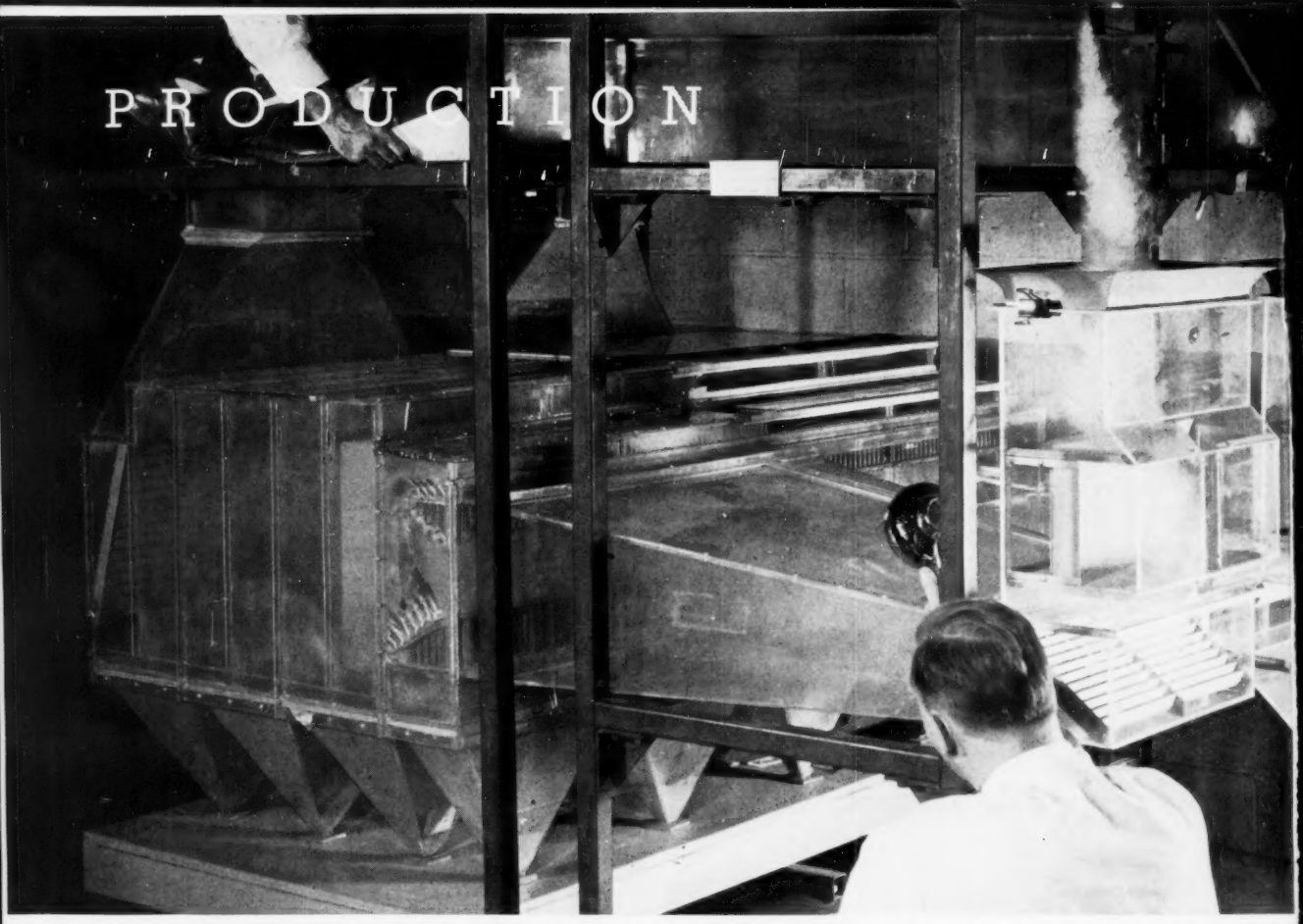


Research-Cottrell design engineer focuses spotlight on transparent duct for study of smoke-flow pattern

# Transparent Models Give Insight into

**Last week, at its Bound Brook, N.J., headquarters, Research-Cottrell, Inc., took the wraps off 10 transparent Plexiglas models that offer a look into the future of electrostatic precipitator installations.**

Studying these models for the past two years, the firm's design engineers have already translated their sightings into savings as high as $80,000 on full-scale installations. And the future holds even greater promise.

These savings have been possible, as R-C points out, because the design of electrostatic precipitators has not been an exact science. Much of the theory of gas flow—one of the most important factors in precipitator design—was developed in the 19th century, but little was done to combine it with experimental field work until the 1910s and '20s, says the firm's director of research and development, Harry J. White. And then, most of it was connected with aeronautical rather than industrial developments.

" 'Primitive' may be a little strong as a word to describe the stage of study of gas flow in industrial applications. But that word sums up the situation pretty well," says White, though he points to a few exceptions, such as work by New York University and University of Michigan in the field of air flow around buildings (*CW, Nov. 9, '57, p. 45*).

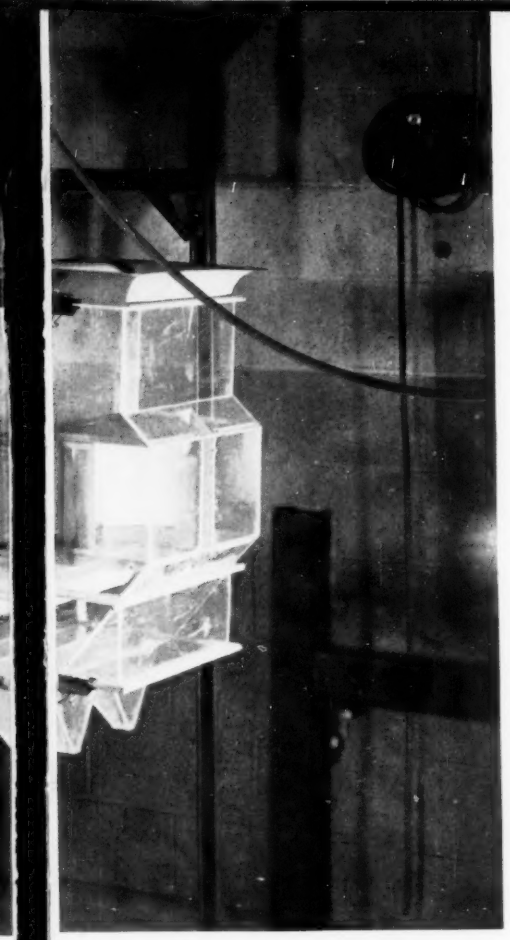
**Rule-of-Thumb Design:** For many years, precipitators have been built oversize. This insured their meeting the manufacturer's guaranteed efficiency, despite poor gas and dust distribution patterns in the system inherent in empirically designed equipment, says Ralph Willison, assistant director of research and development.

"To overcome the limitations of rule-of-thumb design, we began investigating gas-flow models in 1950," Willison says. But it has been only within the past two years that R-C has used models for serious studies to help with design of actual plant installations.

R-C is quick to point out that use of industrial test models is nothing new, cites the chemical industry's familiar pilot plant. For the study of gas flow, it points to the wind tunnel —the first of which were built several years before the Wright brothers' flight—and to models built by a Baltimore utility company in the late 1930s to study its flue gas problems.

**Small Price, Big Savings:** But R-C has carried experiments further, over the past two years, and has proved that the model studies pay off. It feels that models should be standard procedure for many of its jobs instead of for just a few.

Cost studies of models built so far indicate the model cost is 1 to 2% of the cost of the precipitator. (Precipitator costs run about 60-70¢/-cu.ft./minute of gas to be handled



**in model precipitator system.**

# Big Savings

for the plate-type units designed for dry dusts, slightly higher for the pipe type used for liquids, e.g., sulfuric acid mists.

"Savings in the actual plant installation will vary, of course, but will probably run to eight or 10 times the cost of the model," says White.

**Uniformity Gain:** For one thing, model studies show how to bring the gas into the precipitator in a more uniform manner. The gas has to be expanded from the entrance ducts of a relatively small cross-sectional area, where it may be traveling at about 42 ft./second, to the relatively large cross-sectional area of the precipitator, where it usually travels at about 6 ft./second. By preventing eddies, reverse flows and by distributing the gas more evenly, precipitator efficiency can be improved.

Antipollution laws and plant good-neighbor policies are placing a premium on higher efficiency. And through R-C's studies, efficiency improvement has been equivalent to doubling the size of the installation in some cases, says White. Or units smaller than originally thought possible can be used to attain required efficiency.

**Simplified Flue Designs:** Although many precipitators are sold on a "flange to flange" basis, R-C's experience indicates that largest dollar savings are to be had by including in the original contract for the precipitator a flue design leading to and away from the precipitator.

Model studies show that the abrupt changes in duct direction, size or shape, which are often built into systems to save cost and space, create poor flow patterns—e.g., eddies, reverse flows. Most are difficult or impossible to correct in the short expansion duct into the precipitator. And poor flow patterns in the precipitator cannot be essentially changed.

The poor flow pattern causes poor precipitator performance, leads to accumulation of dust in the ducts. The latter combined with poor temperature distribution results in corrosion.

And in badly designed systems, pressure drops are excessive, and fan power must be upped. While a pressure drop in some processes may be tolerated—it may even be desirable if a pressure process is being vented to the atmosphere—in most cases it is costly. For example, R-C says that each inch of water-gauge pressure drop in a power-plant flue system requires $40,000 to $80,000 worth of extra equipment.

**Time Saver:** It takes six to eight weeks to build a model, but it more than pays for itself in savings in design and field-testing time. "In design work," says Willison, "there is always a difference of opinion. Test models in which we can see the smoke patterns, take velocity readings with miniature Pitot tubes and thermal anemometers, allow us to try out all the design ideas."

Titanium tetrachloride smoke is used in the model to make a readily visible smoke. Model designs are changed until smooth flow is achieved.

Much of the field-testing that accompanies installation is eliminated by the models because guaranteed efficiencies can usually be met with minor adjustments. And this can mean substantial savings. Potomac Electric Power Co., for example, says that if the precipitation system originally planned for its new Montgomery County, Maryland, plant had been installed, the cost of changes necessary to correct reverse flows, etc., shown in model-testing "would have been prohibitive."

**All Relative:** Although the models are built to scale, conditions within cannot exactly duplicate full-scale conditions. But R-C finds that if gas flow within the models is kept in the turbulent, rather than streamlined, flow region, flow patterns in the models correlate nicely with those in full scale. "In one case, we tried to improve on the flow pattern in the field, but we found we couldn't improve on our model study," Willison says.

**When to Use:** At this stage, R-C does not feel that a model is essential in every case. White believes that a gas volume of 100,000 cu.ft./minute is the lower limit. But in special cases, 50,000 cu.ft./minute might be the breakoff point. For example, models were invaluable in designing precipitators for handling 49,000 cu.ft./minute on an aluminum reduction potline, and 55,000 cu.ft./minute in a steelmaking process.

The firm hopes it will be able to study all types of installations—from power plants to acid-making facilities—eventually. In addition to use in designing new installations and improving existing ones, R-C is just now getting started with basic research studies.

Through these studies of fundamental principles, the firm hopes to come up with arrangements to serve as guides for all types of installations.

"We expect to be able to reduce the precipitator size by 10-20%," says Willison. White is less conservative, feels that 25% reduction in size will be possible.

"And we are interested in studying general gas-flow problems that firms might have, with an eye toward contributing to gas-flow technology," says White. Even before it reaches these goals, R-C has shown that chemical process industry firms are in for solid savings through use of transparent precipitator models.

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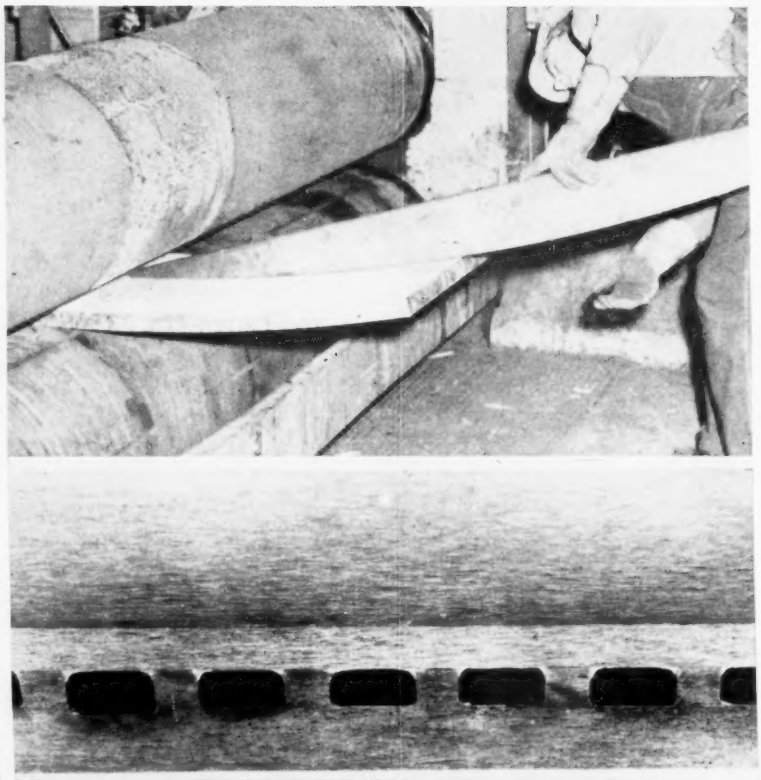

Curvature of channeled plate for cylindrical vessel is tested (top). Cross-section shows clad-metal bonded to channeled steel base (bottom).

# Channeled Plate Cuts Coils

**Equipment buyers this week have a new space-saving construction material to consider for heat-transfer units. Called Channeled Hortonclad, it's a metal wall with internal channels designed to eliminate external heating or cooling coils or jackets. Chicago Bridge & Iron is offering the material, which has already been tested in three commercial installations.**

A cross-section view of Channeled Hortonclad shows a thick plate honeycombed with channels. It's made by CB&I's patented vacuum-bonding process, in which a flat sheet of metal is "laminated" to a grooved sheet of another metal. The channeled base sheet is generally carbon steel; the cladding is stainless steel or any one of a number of corrosion-resistant metals, including copper, nickel, silver and various alloys. Titanium, zirconium, bronze and tantalum are also foreseen as claddings.

According to CB&I, almost any corrosion problem can be met with its wide choice of cladding materials. And the number of different channels and the intricacy of possible channel layouts permit faster heat transfer and more uniform temperature control than any other present methods. Reduced pressure-drops in cooling and heating of liquids are said to be an additional benefit from the independent channels.

There's considerable latitude permitted in choice of channel cross-section. Grooves with depth of ¼-1 in. and width of ½-1½ in. have been made by the company.

Made in flat plates, the Channeled Hortonclad can be curved without affecting bond, layers or channels. CB&I has rolled plates up to $1\frac{19}{32}$ in. thick to a 12-ft. radius in one direction, then in the other, without damaging them. The firm believes that use in cylindrical vessels is feasible.

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Copper Fluoborate
Fluoboric Acid
Fluorine Cells
Fluorinating Agents
Frosting Mixtures
Hydrofluoric Acid Anhydrous
Hydrofluoric Acid Aqueous
Hydrofluosilicic Acid
Lead Fluoborate
Metallic Fluoborates
Potassium Bifluoride
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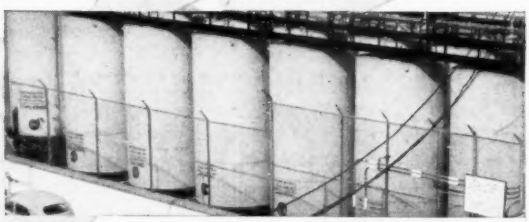
In addition to storage, the terminal provides a variety of services—metering, blending, diluting, denaturing and packaging—all provided with the necessary accountability and accuracy that solves a difficult marketing problem.

If you have a storage problem involving hard-to-handle liquids, call on General American. Leased terminal facilities give you the privacy, safety, flexibility and service of your own terminal—*without capital investment on your part.* Phone or write today. You'll find . . . *it pays to plan with General American.*



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# EQUIPMENT

**Improved Pump Lining:** Dorr-Oliver Inc. (Stamford, Conn.) is now offering Hypalon (a chlorosulfonated-polyethylene synthetic rubber introduced by Du Pont) as a standard lining on its Olivite centrifugal and Oliver diaphragm slurry pumps. The lining is said to provide improved resistance to abrasion and corrosion. D-O says extensive field tests show the elastomer is able to withstand a wider range of temperatures and chemicals (particularly oxidizing solutions), offers potential customers a table of test results. The Olivite, a centrifugal for corrosive-liquid service, is available in 1¼- and 2-in. sizes (4-in. size is now being developed). The Oliver diaphragm is pneumatically operated and is available in 1½-, 2-, 3- and 4-in. sizes.

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**Electrode for Electrostatic Precipitators:** Metal Products Division of Koppers Co., Inc. (Baltimore), is out with a new type of electrode for electrostatic precipitators that is said to increase efficiency by completely controlling the corona discharge—a major factor in the precipitating action.

As gases pass through the precipitator, solid particles receive a negative charge from wire-energizing electrodes, are attracted to grounded collecting plates. It's designed to overcome the clinging of dust to electrodes, which causes an unpredictable, uncontrolled corona-discharge pattern. When dust clings, there is less corona discharge; when the electrode is clean, corona concentration is greater, tends to cause quicker "flash-over" to collecting plates. Efficiency is directly proportional to power that can be introduced into electrodes without causing "flash-over."

The new Koppers' electrode resembles barbed wire. Barb points remain clean; corona discharge is constant at these points. By proper spacing of barbs, complete control of corona discharge is achieved, says Koppers.

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**Monitors:** Beckman's Process Instruments Division (Fullerton, Calif.) is offering two new monitoring instruments—one for determining minute quantities of radioactivity in room air, the other for continuous measurement of one constituent in a gas mixture.

• Model V micro-microammeter will detect alpha, beta and gamma radiations from as many as 20 rooms. Colored lamps indicate which room is being monitored; a visual alarm is built into the instrument panel. Audible alarms and potentiometric recorder and controller can be connected to the monitor.

• Model 7C is a low-cost thermal-conductivity gas analyzer for measuring gases such as nitrogen, hydrogen, argon, carbon dioxide, ammonia. It is suggested as a safety device for monitoring hydrogen in carbon-dioxide-purged systems. Cell response time is 30 seconds for 95% of change at sample flow-rates of 250 cc./minute. Indicating meter with 2% accuracy is available.

**Thickness and Flaw Detector:** Gulton Industries, Inc. (Metuchen, N.J.), has a new Glennite Laminagage designed to take nondestructive measurements of coating and plating thicknesses and detect cracks in base metals. The unit, patented by General Motors Corp., can be used on metals such as cast iron, brass and carbon steel, and on coatings such as paint and porcelain enamel. Each application has its own frequency, bandwidth, calibration and probe. Oscillator units, probes and calibration charts are supplied with the instrument. Interchange is claimed to be quick and easy.

•

**Water Temperature Control:** The Oscar Fisher Co., Inc. (Newburgh, N.Y.), is manufacturing a new unit for controlling water temperature to within 0.25 F. The control, enclosed in stainless-steel case, consists of motor unit with liquid-filled thermostatic elements and pressure-stabilizing and -compensating mechanism, two pressure-regulating controls, pressure gauge, volume control and vacuum breaker. At 45-psi. water pressure, the unit delivers 6 to 125 gal./minute at preset temperature.

•

**Plywood-Molded Pipe:** Plycraft, Inc. (Lawrence, Mass.), says its new plywood-molded pipe can be produced economically in any diameter and lined with materials to suit the service requirements. The firm offers the pipe as a relatively inexpensive way to build large-diameter lines. Previously, plywood-molded pipe was available only in small diameters.

•

**Large-Capacity Ball Valves:** The Vickery Co. (Oakland and Los Angeles) is out with 2- to 24-in. ball valves that require only 90-degree movement from "fully open" to "fully closed" positions. The firm claims bubble-tight performance over working pressure range of 0 to 2,500 psi., and no pressure drop. Typical applications cited: liquid nitrogen at —320 F and 1,200 psig., liquid oxygen at —297 F and 1,000 psig., helium gas at 70 to —320 F and 2,100 psig. The valves are also suggested for acid and fuel service. Remote actuators are offered for all models.

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**Current Converter:** Weston Instruments Division of Daystrom, Inc. (Newark, N.J.), is out with a new low-cost current converter that's said to provide dc. current from ac. and permit use of instruments in applications previously considered impractical. Called Model 9886 Current Converter, the transformer-rectifier provides a dc. output proportional to ac. input, is primarily intended for the firm's dc. instrument-type relays and recording potentiometers. But it can be used with other devices having matching characteristics. Three types for 60-cycle, 5-amp. service are offered: dc. output of 1 ma. into 100 ohms for indicating instruments, relays; dc. output of 5 ma. into 100 ohms for relays; dc. output of 50 mv. in open circuits for potentiometers.

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# Market Newsletter

CHEMICAL WEEK
February 22, 1958

**Price cut impending on phthalic anhydride?** It's possible, of course, but a check among knowledgeable marketers indicates that a downward revision in the near future is highly improbable despite published reports to the contrary.

Reasons are fairly concrete for the belief that the 21¢/lb. (c.l.) tag—in effect for almost a year and a half—will remain pegged. February phthalic sales are showing a decided pickup over last month's, and upcoming spring painting weather will add a further fillip to phthalic movement. Many consumers' inventories of the anhydride are down to dangerously low levels, and underscoring the condition is this: some producers who hadn't seen a "rush" order in months are now getting quite a few.

Biggest deterrent to any likely slash, however, is that price concessions (especially on phthalic) have rarely brought in any additional business. And, add makers, manufacturing costs certainly aren't dropping.

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**Recent 3¢/lb. reduction in ethyl bromide schedules,** bringing carload price down to 43¢, was initiated solely to meet competitive market conditions. Actually, few, if any, consumers have been paying list prices for their ethyl bromide requirements. Thus, the "official" changes (now industry-wide) do little more than recognize the level of current market transactions.

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**U.S. metallic antimony prices are down a sharp 4¢/lb.** Behind the cut: consumers are switching from domestic material to pick up hefty quantities of lower-cost imported antimony.

The new U.S. quotes, reflecting the first reductions since mid-'55, were posted by major producer National Lead, affect two types: RMM, now down to 29¢/lb., f.o.b. bulk, Laredo, Tex., and 31.09¢/lb. in case lots at New York, and Lone Star, selling last Friday at 29½¢ (Texas) and 31.59¢/lb. (New York).

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**U.S. chemical production capacity continues to grow,** making it certain that buyers will have few shortage worries in the foreseeable future. Latest expansions involve soda ash, anhydrous methyl chloride, polystyrene foam, and the so-called synthetic "natural" rubber.

Increase in Firestone's Coral rubber output is a step-up from pilot-plant to semiplant production, brings the country closer to "the possibility of complete independence from outside sources of rubber during times of national emergency." The quotes are from a just-out report by the U.S. Army's Headquarters Quartermaster Research and Development Command, which has long been testing the material. The Army report also states that the synthetic may make it possible to reduce stockpiling of natural rubber at a "great saving of money and space."

**"Completed." That's the stamp placed on expanded Styrofoam** production facilities this week at Dow Chemical's Torrance, Calif., plant. The enlarged units, M. F. Ohman, manager of operations for Dow's Western Division tells CW, "have increased production capacity for the expanded form of polystyrene by approximately 50%. There's no indication, however, how that translates into board feet.

**Word on additional anhydrous methyl chloride** comes in a brief statement by Kolker Chemical Corp.: Production of "high-quality" material has started at a new Newark, N.J., plant. Annual capacity mounts to 4,500 tons/year. Shipment, adds Kolker, "will be made in cylinders or tank cars."

**Dense soda ash capacity is undergoing a double expansion**—now completed are new plants at Saltville, Va. (Olin Mathieson) and Baton Rouge, La. (Solvay Process).

No specific figures are available on either installation, although Solvay describes its operation as "more than doubling previous capacity." The OM plant starts up this week, represents first production of dense material at Saltville; output will supplement soda ash production at the firm's Lake Charles, La., plant.

•

**The first U.S. commercial-scale polypropylene plant is doing o.k.,** say Hercules Powder officials, unwinding fingers that have been tightly crossed since their Parlin, N.J., unit came in a couple of months ago (*CW, Dec. 7, '57, p. 31*).

The company has experienced much less startup trouble than had been anticipated, and is now turning out "commercial quantities on a continuous basis." Understandably, however, the plant is not yet producing at its designed capacity rate of 20 million lbs./year.

Success of the venture belies earlier trade skepticism that a stable resin had been achieved, and consensus now is that the Hercules breakthrough marks polypropylene's initial step to maturity.

**SELECTED PRICE CHANGES—WEEK ENDING FEBRUARY 17, 1958**

| | Change | New Price |
|---|---|---|
| **UP** | | |
| Cottonseed meal, 41% bgs., Memphis, ton | $3.00 | $59.00 |
| Soybean meal, 44% bulk, Decatur, ton | 1.50 | 47.50 |
| Tankage, animal, feeding, 9-11% ammonium, N.Y. bulk, unit ton | 0.25 | 5.25 |
| **DOWN** | | |
| Tallow, edible, tanks, dlvd. | 0.00375 | 0.11 |
| Tin metal (Straits) | 0.005 | .93 |

All prices per pound unless quantity is stated.

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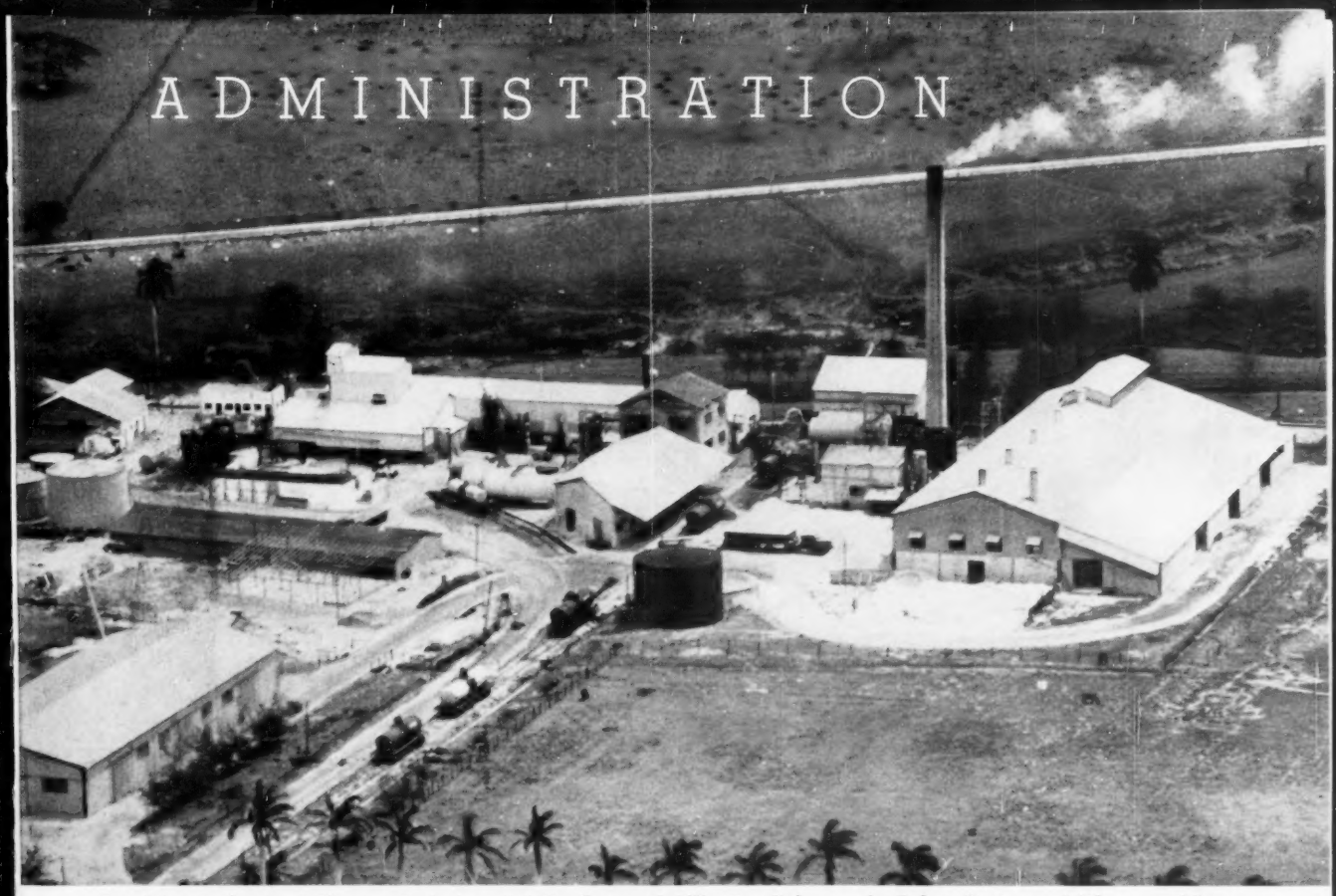

**Combined plant of Electro Quimica del Caribe and Silicatos Cubanos in Cuba, first acquisition marking . . .**

# Allied's New Tack in Foreign Operations

**Allied Chemical & Dye Corp.'s purchase last week of a 50% interest in two affiliated Cuban concerns heralds a move of far-reaching significance to the company. It marks Allied's first participation in manufacturing operations outside the U.S. and Canada, may set the pattern for further acquisitions.**

To close observers, the move was expected. Although the company has relied in the past on a network of some 150 distributors to sell its 3,000 products abroad, its executives have long cherished the desire to manufacture in foreign market areas.

**Sealed Last Week:** The joint venture (agreement was signed Feb. 12) puts Allied in partnership with Electro Quimica del Caribe, S.A., and Silicatos Cubanos, S.A. The affiliated companies—while small by U.S. standards, they are among Cuba's largest—produce chlorine, caustic soda, hydrochloric acid, aluminum sulfate, sodium silicate, sulfuric acid, sodium sulfate and refined salt.

Manufacturing facilities for the concerns are located at Sagua la Grande in Las Villas Province, about 120 miles east of Havana. A deep-water port is some 10 miles away.

**Allied International:** To bring into focus the meaning of the joint venture, take a look at Allied's foreign operations and its methods of selling abroad.

Until a couple of years ago, Allied had seven divisions that were active abroad, each selling as it saw fit; there was no coordinating body as such. But starting Jan. 1, '56, selling activities were centered in a single export market facility—Allied Chemical International. This operation built a staff of more than 70, utilized the services of some 150 distributors.

The result of centralization, says International Vice-President Wesley Wickersham, has been threefold: (1) increased overseas sales, (2) a broadening of products offered overseas, (3) a reduced dependence on large-volume sales in limited areas.

Allied Chemical International is actually two organizations. Sales of products in the Western Hemisphere are handled by an Allied Chemical subsidiary, Allied Chemical International Corp. The International Division, Allied Chemical & Dye Corp., conducts all other foreign trade operations, including sales to U.S. exporters, to U.S. agencies purchasing for export and to foreign government purchasing missions located in this country. The subsidiary was formed in June '54; the division in March '55.

Until Jan. '56, ACI was in the formative stages, occupied with slowly absorbing the export operations of the domestic divisions. On Jan. 1, ACI acquired the export department of National Aniline Division, completing representation of Allied's exported products. By then, ACI had inherited seven different patterns of foreign distribution and some 3,000 products.

**Departments Organized:** After ACI gained control of the seven export departments, it divided the company's

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Catalin also produces a wide range of urea, phenolic, cresylic, resorcinol and melamine industrial resin formulations.

Catalin plastics include polystyrene, polyethylene and nylon molding and extrusion compounds.

**Winfield (left), Wickersham: Overseas**

products into three categories for handling by three separate departments: Agricultural Chemicals, Industrial Chemicals, and Specialty Chemicals. Each is headed by a sales manager of its own.

President of ACI is James Sheridan, also a vice-president and treasurer of Allied Chemical. Management responsibility in ACI is divided between Wickersham, who heads operations and sales, and William Winfield, also an ACI vice-president, who supervises market analysis, studies of foreign development possibilities, advertising and publicity.

The top three ACI executives have high hopes for their operation. As Wickersham sums up the activities to date: "We've broadened and strengthened our worldwide chain of distributors by increasing field contact, and by specially prepared sales and technical literature. Now we're aiming to provide our distributors with sales tools that will stress major applications of specific products. We will also improve our technical service."

**Preparation for Things to Come:** Reorganization of Allied's export operations had to be done before undertaking a joint venture that called for overseas manufacturing. The company feels that it was necessary to provide coordinated, integrated marketing lines

**selling takes overseas producing.**

for domestically produced products, and that it was vital that such lines exist before foreign manufacturing could be integrated.

World economic conditions have served as much as anything to hasten management's decision to produce overseas. The firm's awareness of world conditions and the key to the company's future actions are clear. Says Sheridan: "Total U.S. exports of chemicals have increased each year for the past six years. For the past four, they've exceeded those of the Korean War peak year of '51 (exports that year were $1,125.5 million), and since '25 have multiplied 10 times over, more than twice the growth of the gross national product over the same period."

But in predicting the lot of chemical exports in '58, Sheridan emphasizes the deterrent factors operating against expanding U.S. exports: "It will be a year in which trends evident in '57 will become stronger. Dollar shortages will grow worse before they get better. Stronger competition from both European and Japanese exporters is to be expected in all areas.

"Some countries will raise tariffs on some products to protect newborn domestic producers. More U.S. companies will announce plans for overseas production. The licensing prac-


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Major use: Polyvinyl chloride blowing agent.

**Catalin UV-1** . . . a cinnamic aldehyde derivative. Major use: an ultraviolet absorber for methacrylate.

**Sodium Amide**
Major use: Preparation of aminopyridines, pharmaceuticals, dyestuffs, perfumes.

**Alpha-Amino Pyridine**
Major use: Manufacture of pharmaceuticals, and anti-histamines.

**2,6-Di-Amino Pyridine**
Major use: Synthesis of pyridium.

**Mucochloric Acid**
Major use: Preparation of color film.

**Parachlorometacresol**
Major use: As a fungicide and preservative

**Thiosemicarbazide**
Major use: Preparation of pharmaceuticals.

**Heptaldehyde**
Major use: Preparation of perfumes, pharmaceuticals. Also used as an accelerator for rubber and vinyl.

**Undecylenic Acid**
Major use: Preparation of pharmaceuticals.

**11-Bromoundecylenic Acid**
Major use: Preparation of pharmaceuticals.

**Hydrazine Sulfate**
Major use: Organic synthesis and as a reagent in separating copper.

**Catalin Bacteriostat CS-1**
Major use: Soaps, shampoos, cosmetics, pharmaceuticals, etc.

**Methylene Aniline**
Major use: Hardening agent and chemical intermediate. Pilot plant quantities.

Catalin welcomes inquiries from manufacturers using these chemicals in their research and production processes.

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| 100% Modulus | 1320 psi |
| Tensile Strength | 2695 psi |
| Elongation | 338% |
| Hardness, Shore A | 80 |
| $T_f$ | —17.3°C. |
| Flux Time | 45 seconds |

**heat stability (180°C.)**

| | |
|---|---|
| Initial Discoloration | 15 min. |
| Maximum Discoloration | 90 min. |

**extraction loss**

| | |
|---|---|
| Water | 0.21 % |
| 1% Soap | 3.45 % |
| Mineral Oil | 2.10 % |

**migration**

| | |
|---|---|
| Lacquer, 25°C., 14 days | Very slight softening |
| Varnish, 25°C., 14 days | No effect |
| Polystyrene, 60°C., 19 days | No effect |

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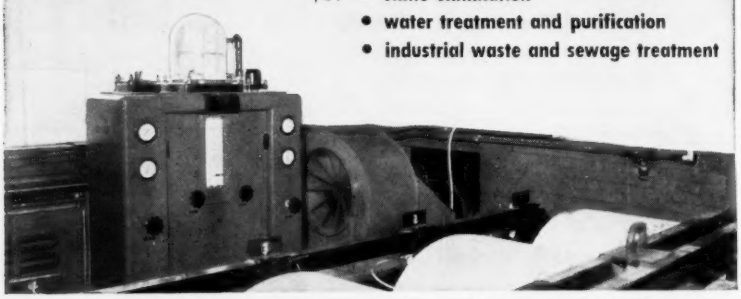

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tice will continue to grow stronger."

Further indication of Allied's ultimate intentions were revealed only a short time ago, when, while reviewing the distribution setup, Wickersham said, "One problem ACI has is to locate distributors who can handle such a tremendous number of products. It's unusual to find a man who is equally familiar with plastics and fertilizers. While ACI is busy strengthening its present setup for selling abroad, it sees the day when Allied Chemical will also have plants and sales offices overseas."

**Good Future in Cuba:** Allied sees a good future in Cuba. In addition to the government's program to reduce the nation's dependence on sugar, there are three government-backed projects to produce paper from bagasse (the waste left after the syrup has been squeezed out of sugar cane). This development is expected to demand greater quantities of chlorine and caustic soda.

In addition, the Cuban government's determination to increase treatment of the island's drinking water will result in greater demand for chlorine and aluminum sulfate. At present, only 10% of the drinking water for Cuba's 6 million inhabitants is treated.

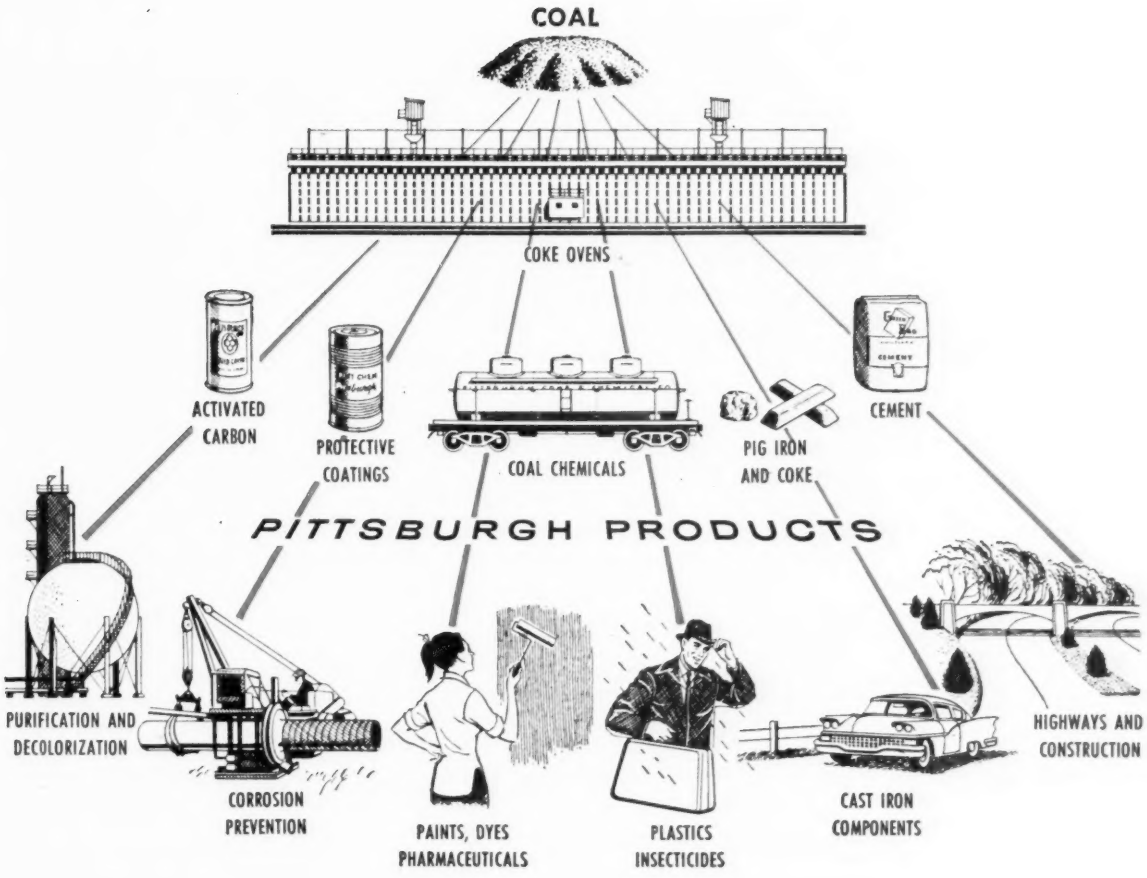
New outlets for hydrochloric acid, now used primarily for sugar refining, will be in oil well treatment and in the production of cobalt and nickel.

Allied's big customers in Cuba will undoubtedly include Freeport Sulphur, National Lead, Owens-Illinois Glass, Phelps-Dodge, Reynolds Metals, Republic Steel and three major U.S. rubber companies.

But perhaps more significant is the long-run experience to be gained from the new arrangement. Allied's primary emphasis is now on Latin American markets (30% of ACI's sales go to Latin America) because of their proximity and established trading relationships, and because the area is a natural market partner for the U.S.

As Sheridan puts it, "Allied's acquisition of half interest in the companies has a two-pronged purpose: to learn to work in close harmony with the Latins, and to adjust to manufacture on a smaller scale—a necessity in Latin American countries."

Allied isn't saying where its next move will be, but the Cuban venture appears to be a clear promise of further overseas expansion.

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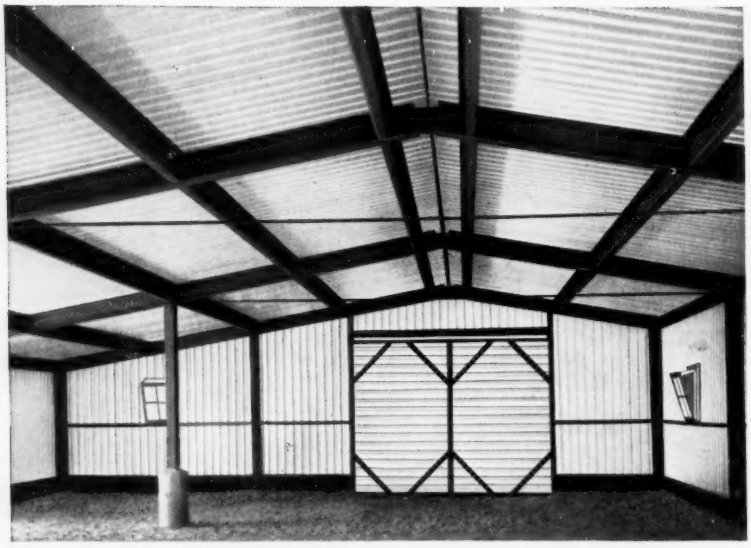

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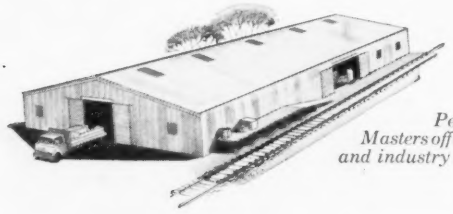

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Chairman Reuther: Wage hikes should be a goal for every union.

## Bargaining Shapes Up

**Union bargaining goals for 1958's upcoming sessions in the chemical process industries are beginning to take shape. This weekend, in Denver, members of Oil, Chemical & Atomic Workers' policy-shaping executive committee are meeting to discuss specific aims.**

In January, International Chemical Workers Union reported some of its goals, and last week, in Miami, the parent AFL-CIO executive committee shaped guiding policy for all of its members.

**Parent View:** AFL-CIO leaders emphasized that members should seek higher wages, pointedly reiterated that wage increases are not the cause of inflation. Indeed, they see wage increases as the means to beef up purchasing power during recessionary periods.

The economic policy committee, headed by United Auto Workers President Walter Reuther, also called for stepped-up state unemployment insurance payments, extension of reciprocal trade agreements, and increased federal spending for foreign aid, national defense and other areas as spurs to business activity. In addition, the committee endorsed an "emergency" economic and legislative conference to be held in Washington in March, intended to exert pressure for economic stimulants.

**Chemical Groups:** In line with recommendations of the parent union, neither of the principal unions representing chemical workers, OCAW and

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# U.S.I. CHEMICAL NEWS

February 22 ★ A Series for Chemists and Executives of the Solvents and Chemical Consuming Industries ★ 1958

## U.S.I. in New Company to Develop High Energy Fuel

A new company has been formed to carry out process development and semi-pilot plant work on a high energy, boron-based fuel, under Air Force contract. The company, AFN, Inc., is owned one-third each by American Potash, Food Machinery, and the U.S.I. Division of National Distillers.

The combined resources and knowledge of the three participating companies cover almost the entire chemical industry. U.S.I. produces sodium, polyethylene, alcohols, special metals, and a large variety of other chemicals. American Potash makes boron chemicals, lithium, chlorates, perchlorates, and many other products. Food Machinery supplies alkalies, phosphates, peroxygen chemicals, insecticides, among other products.

The initial work will be carried out at Henderson, Nevada.

## *Ammonia, Sodium Metal Used for Recovering Pure Anhydrous Hydrazine*

A solution has been found to the difficult problem of separating ammonium chloride from hydrazine made by the oxidation of ammonia with chlorine. The patented process provides for the addition of metallic sodium in anhydrous ammonia to the mixture of hydrazine, anhydrous ammonia and ammonium chloride.

The sodium reacts with ammonium chloride to produce ammonia, hydrogen and sodium chloride. Since salt is relatively insoluble in liquid ammonia, most of it precipitates out as a solid which can be removed easily by filtration, decantation or other similar means. A solution of hydrazine in liquid ammonia remains, from which pure hydrazine is readily recovered by fractionation.

Yields in the order of 97% have been obtained by adding an amount of sodium exactly equivalent to the chloride ions present. The reaction proceeds at room temperature.

U.S.I. is a producer of metallic sodium and anhydrous ammonia, both of which are used in this process.

## Metals Can Now Be Melted While Suspended in Space

A new technique called levitation melting permits researchers to prepare small specimens of metals and alloys with purity levels difficult to reach by ordinary means. The metal or alloy is placed in a high frequency AC electro-magnetic field which causes it to float freely suspended in space, and to melt.

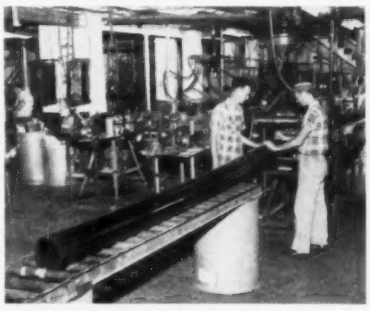
The process uses no containing vessel, and proceeds in an inert atmosphere, eliminating sources of contamination. Melting is achieved in seconds, and electro-magnetic stirring action gives thorough mixing of the melt.

MORE

# Longest Polyethylene Pipeline Carries Brine Between Process Plants at Ashtabula, Ohio

### Pipe Made of U.S.I. PETROTHENE® Resin Runs for 6,200 Feet From Mallory-Sharon Metals Plant to U.S.I. Sodium Plant

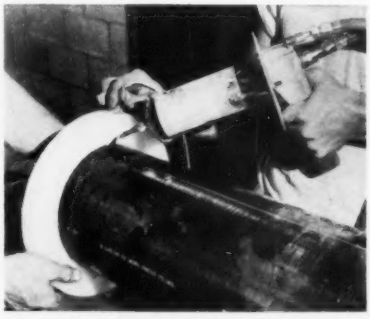
When the problem arose of moving a corrosive solution of saturated brine over 6,200 feet of terrain broken by roads, streams and railroad tracks at Ashtabula, Ohio, U.S.I. decided to use a polyethylene pipeline. Polyethylene was chosen for the job after a thorough study of other materials such as plastic-lined iron, rubber-lined steel and polyvinylchloride. It has the advantages of corrosion resistance, minimum maintenance requirements, ease of fabrication and installation.



Polyethylene pipe leaving extruder at Carlon Products' Asheville, N. C. plant.

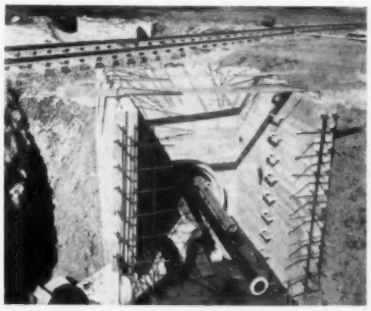
Now in operation, the pipe has an inside diameter of six inches, an outside diameter of 7¼ inches. It is made of U.S.I. PETROTHENE 561 virgin polyethylene compounded with carbon black. The pipe was supplied in 30-foot lengths flanged with polyethylene rings and bolted together at the installation site.

Carrying brine at temperatures ranging from 70 to 90°F. 24 hours a day, 7 days a week, the pipe runs from the brine settling pond at Mallory-Sharon Metals zirconium and titanium sponge plant to the sodium plant of U.S.I.



After cutting pipe into 30-foot sections, polyethylene flanges are hot-gas-welded to pipe.

Steel back-up rings are attached to flanges where elbow meets straight section of pipe.



At site, sections run beneath railroad rest on metal support in reinforced concrete conduit.

After connecting lengths of pipe, line is rolled into trench, needs no further attention.

February 22 ★ **U.S.I. CHEMICAL NEWS** ★ 1958

CONTINUED

## *Metals Melted In Space*

Upon completing the melt, the voltage is lowered, allowing the molten metal to be dropped into a mold. The metal or alloy specimen which results can be used for mechanical testing, metallographic examination, hardness measurements, X-ray diffraction or magnetic studies.

Levitation melting apparatus has been studied at the U.S.I. metals laboratory at Cincinnati, Ohio, for the examination of zirconium, titanium and other special metals.

**Levitation melting apparatus in operation. (Photo courtesy Westinghouse Industrial Electronics Department.)**

## Urethane Foam Can Now Be Sprayed on; It Cuts Insulating Labor Costs

Equipment and techniques for spraying urethane polymer onto overhead, vertical or irregular surfaces, so that it foams and sets in place, have recently been perfected. Insulating coats up to two inches thick can be applied rapidly to vessels, buildings and machinery with no slipping, sagging or falling away of the foam.

In test applications, insulating jobs have been completed in 1/12 the time (calculated in man-hours) required for installing conventional insulating materials. Suppliers of polymer and spray apparatus figure that on ordinary jobs, a trained operator can apply 12 sq. ft. per minute of one inch thick foam.

Since urethane foams are formed by mixing a catalyst with a liquid prepolymer just before application, special spray equipment has been developed which proportions the two materials accurately, and mixes them thoroughly. The polymer formulation itself has been adjusted to meet two opposing types of requirements. It foams and sets rapidly enough to give proper thickness and good adhesion to surfaces. At the same time, it foams and sets slowly enough to avoid clogging of the spray gun.

Flexible and rigid polyurethane foams are produced from the reaction of polyesters with diisocyanates. An intermediate that can be used to produce the polyesters is U.S.I. ISOSEBACIC acid, a mixture of C-10 dibasic acids.

## *New Decomposition Unit Regenerates Spent Sulfuric At U.S.I. Sunflower Plant*

Sulfuric acid regeneration facilities have recently been added to the Sunflower Ordnance plant operated by U.S.I. at Sunflower, Kansas. The new installation converts spent sulfuric acid into sulfur dioxide for use in the plant's oleum and virgin sulfuric acid production process.

Its design capacity is 70 tons of alkylation spent acid per day. The regenerated sulfuric acid is identical to that produced from sulfur.

The unit has no effluent, uses no water and requires only a minimum of outside fuel. Much of the heat is provided by the hydrocarbons in the spent acid, while natural gas and sulfur supply the balance.

With the addition of these new facilities, the Sunflower plant now has a capacity of 250 tons per day on a 100% sulfuric acid basis.

## TECHNICAL DEVELOPMENTS

***Information about manufacturers of these items may be obtained by writing U.S.I.***

**Chemical literature is described** and classified in a 398-page guide now being sold. Kinds of chemical information are analyzed, ways of keeping current are suggested, use of libraries and indexes is discussed. **No. 1321**

**New anionic surface active agent** is used in the emulsion polymerization of monomers. It is said to act also as a stabilizer for compounding natural and synthetic latices. **No. 1322**

**Polyurethane elastomers** are described in a new booklet covering physical properties, thermal stability, low temperature behavior, adhesion, carbon black level, peroxide concentration, solvent resistance. Many charts are included. **No. 1323**

**To measure the dielectric constant** and dissipation factor of insulating materials, a new analyzer has been developed which is direct-reading, non-destructive. It can be used to inspect incoming materials or machine output. **No. 1324**

**Two new silicone compounds** designed specifically for production of sponge are now on the market. Claimed to form uniform, unicellular sponges which surpass organic sponges in resistance to ozone and weathering. **No. 1325**

**An adhesive consisting of a cyanoacrylate monomer** modified with thickening agent and plasticizer is now available in limited quantity. Requires no heat, excessive pressure or catalyst for curing, contains no solvent. Said to have remarkable rapid set time and strength. **No. 1326**

**More than 4,500 unclassified Atomic Energy Commission research reports** are listed in the government's semi-annual price list now available. **No. 1327**

**A new wire enamel and a new insulating varnish** can be combined in electrical systems to withstand hot spot temperatures of 180 C. At the same time, they can be applied and cured at conventional temperatures of about 150 C. Both are polyester-type materials. **No. 1328**

**Methallyl alcohol** (2-methyl-2-propene-1-ol) can now be obtained in research quantities. It acts as intermediate for methallyl derivatives, can take part in polymerizations. Suggested uses: synthesis of adhesives, resins, rubber. **No. 1329**

**Properties of heat resistant, cast high alloys** have been compiled in a set of 14 data sheets. Information is complete, up-to-date, includes room- and high-temperature properties, uses, design and fabrication features, structure. **No. 1330**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**Pharmaceutical Products:** DL-Methionine, N-Acetyl-DL-Methionine, Urethan USP, Riboflavin USP, Intermediates.

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**Reactive Metals, Oxides and Salts:** Zirconium, Zirconium Oxide, Zirconium Tetrachloride, Titanium, Hafnium, Hafnium Oxide, Hafnium Tetrachloride.

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ICWU, intends to soft-pedal wage increases. Though much '58 bargaining is expected to concentrate on unemployment (*CW, Feb. 15, p. 22*), with consequent discussion of shorter working hours as an alleviative, OCAW and ICWU have both gone on record as intending to seek improved wages. These will probably be in the range of 8-12% more than current rates.

Both unions will mount "militant and aggressive" organizing campaigns, even in the face of the tough odds posed by the recessionary atmosphere. O. A. Knight, OCAW president, has said, too, that he'll propose a production-sharing scheme based "on a royalty on physical production in the various process industries—with the royalties collected to be prorated to the account of each individual wage earner concerned. Such a fund could be used to cover catastrophic illnesses not covered by regular insurance, to send children through college, to serve as severance pay in case of layoff and to supplement retirement funds."

In Akron, O., ICWU's executive board, meeting in January, announced that one of its big goals was organization of Du Pont explosives plants; a survey of such plants is nearly complete. Facing the prospect of layoffs, the board has also okayed a procedure "whereby members taking withdrawal cards from ICWU will be informed of what other unions recognize the cards in their jurisdictions."

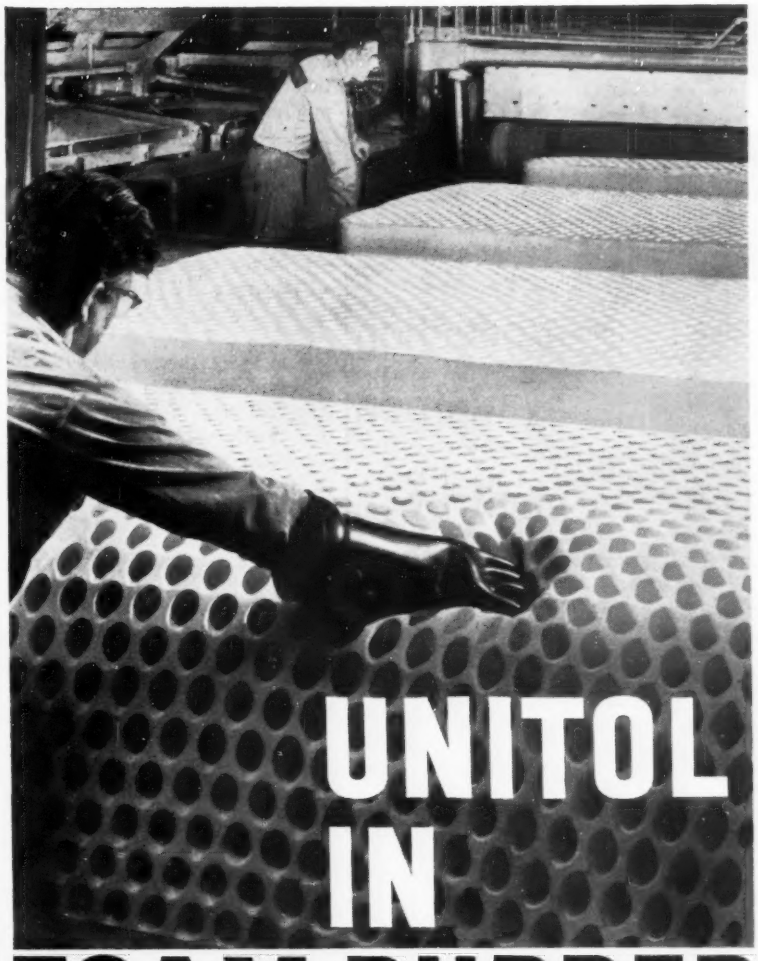
Though pronouncements have been made in all quarters, it's still too early to tell how union bargaining will fare. Many contracts, including most of OCAW's 600-odd contracts in the oil industry, will be open for negotiation late this spring or in early summer. As those days approach, the "militancy and aggressiveness" of the unions will be tested.

## IDEAS

**LP-Gas Fact Sheet:** The National Liquefied Petroleum-Gas Council has issued a 20-page booklet designed to help member companies handle public relations during accidents and emergencies. It supplements a previous council offering titled "Working With the Press," includes a fact sheet on the LP-gas industry.

•

**People and Paychecks:** Standard Oil Co. of California hopes to strip

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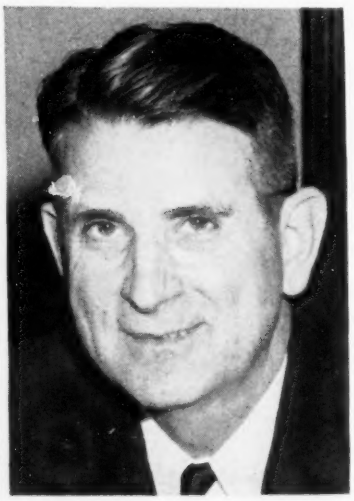
## LEGAL

**More on 'Fair Trade' Laws;** Another state "fair trade" law has been partly voided, and Union Carbide Corp. has failed in its attempt to block retail stores in Mentor, O., from selling Prestone antifreeze at less than manufacturer's suggested retail price.



Rep. Harris: Advocating a federal law affecting 'fair trade' pricing.

In ruling against Carbide, Ohio's supreme court unanimously held that the state law does not apply to nonsigners of "fair trade" contracts. The law allows manufacturers of trademarked products to set minimum prices by individual contracts with dealers. Sale of the products by signers of such contracts, at less than the set price, is still considered an unfair practice. The remainder of the law is not affected by the court's decision.

This decision and others in recent years—last October the New Mexico supreme court declared unconstitutional a similar section of that state's "fair trade" law (*CW, Oct. 26, '57, p. 36*)—have brought on a proposal that Congress pass a federal law applying the principle to goods traded in interstate commerce.

Rep. Oren Harris (D., Ark.) has introduced a bill to this effect, prepared by the National Assn. of Retail Druggists. The measure would amend the Federal Trade Commission Act, and would make it illegal for a retailer to cut the manufacturer's suggested price if the manufacturer gave notice of his policy. The law would apply only to trademarked products and there would be no nonsigner clause. The bill makes participation by manufacturers elective.

The existing federal law covering "fair trade" is the McGuire Act of 1952. It authorizes state legislatures to legalize fair trading if they want to. Forty-five states have such laws, but courts in 14 of the states have nullified all or part of the laws.

## KEY CHANGES

**Vincent P. Brunelli,** to president, Lady Esther Division, Chemway Corp. (Wayne, N.J.).

**M. Crosby Bartlett,** to director and vice-president, B. B. Shuttleworth Co., Ltd. (Toronto, Can.), division of Pitman-Moore (Indianapolis).

**Clement H. Watson,** to director, Alco Oil and Chemical Corp. (Philadelphia).

**Nelson F. Peterson,** to senior vice-president; **Robert A. Hardt,** to executive vice-president for marketing; **Raeto Schett,** to vice-president, technical department; **Donald A. Brisbane,** to financial vice-president; **Oscar A. Zeitz,** to treasurer; **Robert W. Smith,** to general manager, Vitamin Division; and **James P. McKenna,** to controller; all of Hoffman-La Roche (Nutley, N.J.).

**Parker S. Dunn,** to director, American Potash & Chemical Corp. (Los Angeles).

**Richard O. Roblin,** to general manager, Commercial Development Division, American Cyanamid Co. (New York).

**George B. Meredith,** to vice-president in charge of production; and **Frank O. Agel,** to vice-president in charge of development, Nitrogen Division, Allied Chemical & Dye Corp.

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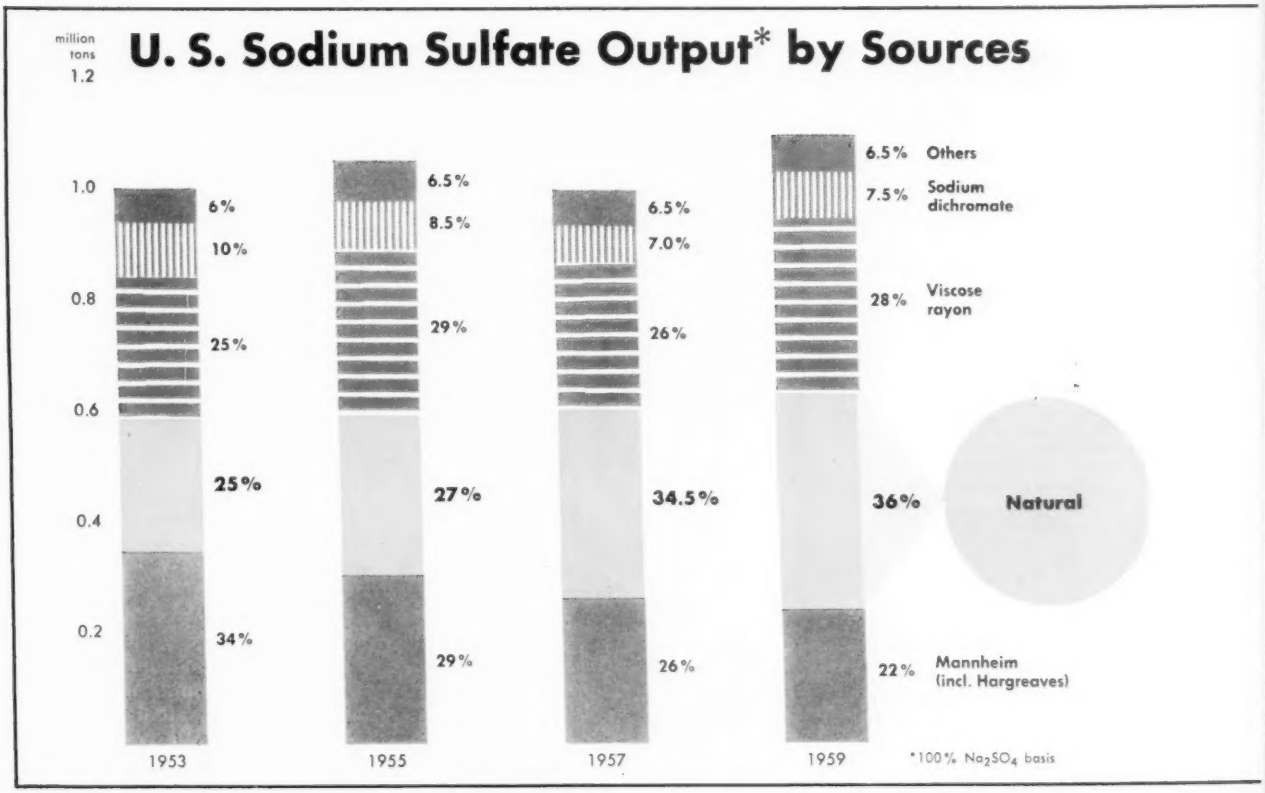


# Sulfate Sources Shift but Supply Is Ample

**The recent decision by Ethyl Corp. to cease making hydrochloric acid by the Mannheim process* (CW Market Newsletter, Jan. 25) will result in removal of some 55,000 tons/year of salt cake (by-product sodium sulfate) from the U.S. market. Does this portend a shortage? "No," say unperturbed consumers, but it does underscore the changes in U.S. sources of the sulfate.**

Ethyl's withdrawal, in fact, will probably not even alter the over-all U.S. sulfate output trend, which has been gently upward for several years. U.S. sodium sulfate output forecast for '59 is 1.1 million tons, which would be a slight gain over the 1 million tons produced in '53 (combined synthetic and natural materials—100% $Na_2SO_4$ basis).

**Source Shift:** This loss of Mannheim-produced sulfate, however, may be seen when viewed with salt cake sources as the frame of reference. As recently as '53, this acid process provided 34% of all sodium sulfate made in the U.S. In '56, Mannheim sulfate provided only 28% of the total, compared with 30% from natural brine sources. By '59, natural material will account for an estimated 36% of the total production, further diminishing the importance of Mannheim material, which will provide about 22% of U.S. supplies.

There are three main reasons for the switch: producers of natural sodium sulfate (from brine wells) have expanded plant facilities; the Mannheim process—as an acid source—has been declining in popularity; viscose rayon output—also an important source of by-product sulfate—has been backsliding.

**Natural Upsurge:** Major contributors to the increasing production of natural sodium sulfate have been two firms—West End Chemical, which went onstream with a 150-tons/day brine processing plant in '55, and American Potash & Chemical's expansion of its facilities at Searles Lake.

But other producers of natural sulfate have contributed to the shift, too. This includes:

- Ozark-Mahoning, which makes the salt from subterranean brines, at Monahans, Tex.
- William E. Pratt, which mines the material from Wyoming deposits.
- Iowa Soda Products, also producing from Wyoming deposits.

In addition to deposits now being mined, many others have been found, assuring adequate supplies for a long time (although not all discoveries are now considered economically feasible to tap). States with known sodium sulfate resources include: Texas, Arizona, California, Colorado,

*The Mannheim process of making hydrochloric acid involves roasting of sodium chloride and sulfuric acid; salt cake is produced as a by-product.

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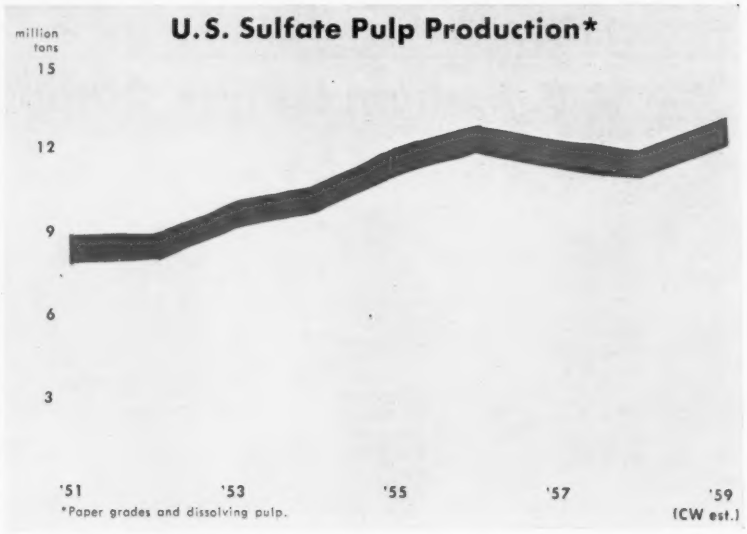


Nevada, Oregon, Washington, Utah, Nebraska.

**Mannheim Plummet:** It has been the development of alternate methods of producing hydrochloric acid that has caused the recent decline of the Mannheim process as standard source of the acid. Most U.S. hydrochloric acid is now obtained as by-product from organic chlorination process—notably chlorination of natural gas, olefins, benzene.

Trade consensus is that before long the Mannheim process will become obsolete. Estimates are that only 14% of the nation's acid needs will be met by the Mannheim process in '59, compared with 23% in '53; the corresponding effect on production of by-product sulfate will be to drop supplies from this source from 34% of total in '53, to an estimated 22% in '59.

**Rayon Backslides:** Third most important source of sodium sulfate is the viscose rayon industry. Last year, its contribution dropped to some 26% of total sulfate output; in '55, it provided about 29% of the total. Only about half of all U.S. rayon producers are now recovering the sulfate. Some industry experts think rayon manufacture will boost its contribution to about 28% in '59. And an added spur to sulfate recovery, notes one spokesman, may come with the trend to greater stream pollution control.

Meanwhile, since the record rayon output of 973 million lbs. in '55 (including both viscose and cupra), the rayon industry has suffered strong setbacks. Output last year was 878 million lbs., and this year there may be another production drop. Reason: inroads gained by synthetic fibers, notably nylon, in the tire-cord market. (Nylon-cord tire sales are estimated to have jumped 30% higher in '57, compared with '56.)

Producers of rayon-cord tires are intensifying their drive to keep top share of the $275-million annual tire market; they point to the marked improvements in high-tenacity rayon, conduct tests to demonstrate the qualities of rayon-cord tires.

Major factors that enable rayon-cord tire makers to hold on to the largest slice of the tire market:

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Should any car manufacturer switch to nylon-cord tires as original equipment, the rayon industry would suffer a serious blow, and users of sodium sulfate derived from viscose rayon would feel the drop immediately.

**Other Sources Hold Up:** The manufacture of sodium dichromate also yields by-product sodium sulfate. In '59, about 7.5% of total sodium sulfate will be derived from this process. The manufacture of phenol from benzene, and production of lithium sulfate, boric acid and formic acid all provide by-product sodium sulfate. These sources will contribute another 7% to total sulfate output in '59. None of these miscellaneous sources

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is expected to increase significantly its relative share of total sodium sulfate output; together, they will likely continue to contribute about 15% of all the salt cake made in the U.S.

**Ample Supply:** Whatever the source, supplies of sodium sulfate in the immediate future will be "more than adequate," say industry spokesmen. The so-called shortage in '54 and '55, which worried consumers, was brought about by a scrambling for supplies because of shortage rumors.

Demand for sodium sulfate is, of course, tied directly to sulfate pulp production, which takes about 74% of all available supplies. Any setback in sulfate pulp production would immediately affect the demand for the sulfate.

Until '56, U.S. output of sulfate pulp—which represents about 56% of total wood pulp made—increased at a fast clip. Production in '56 was some 12.4 million tons, 44% more than '51's 8.6-million-tons output.

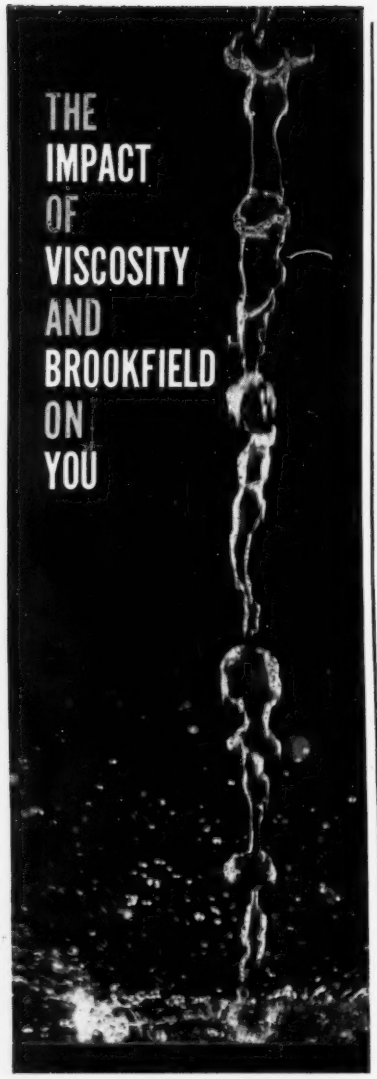
Last year, however, due to dwindling demands and increased stocks, sulfate pulp output dropped to 11.9 million tons, some 4% less than in '56. Although another slight decline in output is expected this year, sulfate pulp producers hopefully predict a banner year in '59, estimate that sulfate pulp production will be about 12.6 million tons.

Another outlet for sodium sulfate is the glass industry, which takes about 11% of total U.S. consumption.

Sodium sulfate's use as a filler in the production of powdered synthetic detergents calls for an estimated 6% of total demand. This outlet is, of course, keyed to the increasing use of solid synthetic detergent. For example, the latest report by the American Soap and Glycerine Producers Assn. shows that sales of solid synthetic detergents hit an all-time high of close to 2 million lbs. in '57, representing an impressive 110% hike over sales of these materials in '51.

Miscellaneous uses of sodium sulfate—e.g., medicinals, stock feed, textiles—account for about 9% of total consumption.

It's fairly certain that production of by-product sodium sulfate will decline in the years ahead. But there's every reason to believe that the natural product will easily fill the supply gaps whenever, and for whatever reason, they appear.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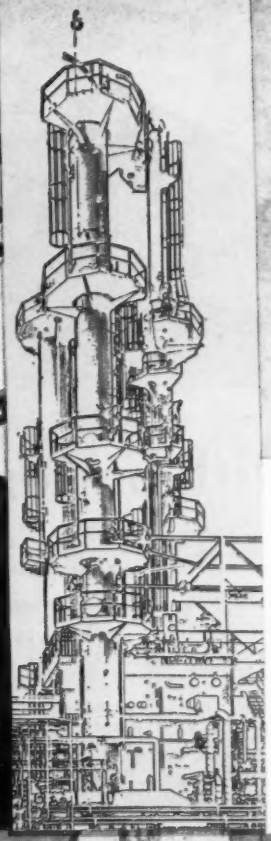

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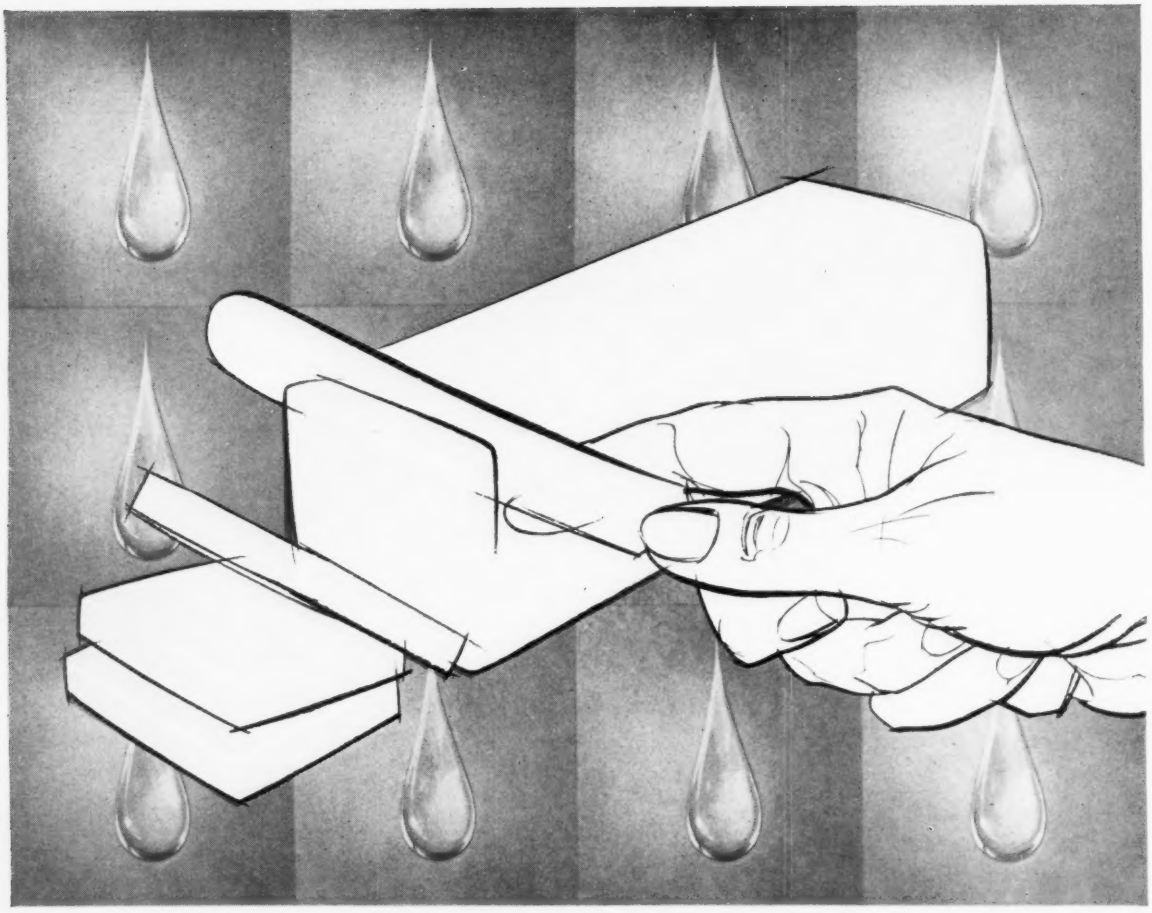

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Adds a coordinating administrative organization to research and development setup. Group will speed decisions on new-product ideas.

**AT DAVISON,**

*O. D. Myrick organizes Development Planning Dept.*

**LESS DETAIL**

Provides more time for long- and short-range planning. Department no longer responsible for constantly checking research project economics.

# Looking to Faster New-Product Planning

**Companies seeking to improve coordination between departments and to speed long-term planning this week have a variety of new approaches to study. Recent shifts in commercial chemical development organization at American Cyanamid, Goodyear, Davison and the Plastics Division of Monsanto offer some examples of how planning and coordination gains can be made.**

Union Carbide Chemicals, in a related but not identical move, has combined separate sales and sales development departments into a new, integrated marketing department (*CW, Dec. 28, '57, p. 18*). And Diamond Alkali is greatly expanding sales developing operations.

Most of the shuffles aim at solving or alleviating one of the traditional, major problems of commercial development—the lengthy time factor between locating a business opportunity and mobilizing a company venture to capitalize on the idea. Routes to this goal vary, from American Cyanamid's idea—a Commercial Development Division that will foster and consolidate long term planning—to Davison's plan—a Developing Planning Dept., with a special staff for the job. Here are details on how chemical process firms are revamping development structures:

**American Cyanamid:** Chief purpose of Cyanamid's new division, says the general manager of the division, Richard Roblin, is to locate new fields of business activity. As such, the division will operate mainly in areas not now covered, or in areas that cut across divisional lines. Other Cyanamid divisions will handle development functions for products that mesh smoothly with their own activities.

The Commercial Development Division serves as an arm of a commercial development committee headed by Executive Vice-President Kenneth Klipstein. The committee is comprised of the vice-presidents for sales, production, research and engineering and the budget director. Internally, the new division has three departments:

- Market development. Principal task consists of finding new markets, developing products to serve them.
- Market research. Works for company and company divisions. Emphasis is placed on evaluating new and old markets.
- Planning department. Coordinates and assists divisions in formulating long-range plans. Assists in

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evaluating capital projects and acquisitions. The division, as a whole, says Roblin, operates chiefly as a staff operation. But the division can and will initiate and carry out projects on its own.

In the past, Cyanamid's corporate planning was largely on an informal basis with individual divisions charting their own courses. Now, long-range planning will be integrated and greatly encouraged. Other benefits in view: faster and more thorough evaluation of new projects; an always-current and balanced view of development operations; quicker decision-making and control of potential bottlenecks.

**Goodyear:** The seven-man New-Products Dept. at Goodyear Tire is an administrative unit designed to give centralized evaluation—at high management levels—to ideas from the firm's development setup. Actual research and development work will be performed as before, by individual product divisions.

Chief of the new unit, M. J. DeFrance, sees a twofold function for his group:

- Coordinate ideas and work of various company departments.
- Make decisions to expedite, defer or abandon new product ideas.

Organizationally, DeFrance has three administrators (finance, marketing, technology) reporting to him. The group hopes to weed out unattractive proposals and projects, speed work on promising products and businesses. Reportedly, Goodyear will pump $1 million into the department this year.

**Davison:** Until formation of the new Development Planning Dept., this function at Davison was the responsibility of the research and development staff. The new department's director, O. D. Myrick, Jr., estimates that at least 50% of the group's time was consumed in refining market evaluations for products being researched. This situation markedly curtailed the time available for long-range planning and appraisal of business ventures. In the new setup, development planning is done by a separate group, which is no longer responsible for continuous economic evaluation of research items.

Myrick reports directly to Davison's president. The department's staff consists of specialists in market research, finance, and process and engineering

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economics. The department will serve all three Davison divisions and coordinate with Grace's central development group.

Immediate goal of the section is an analysis of Davison's current strength and weaknesses and production of a short-term (5-year) plan. Special emphasis will be on activities promising to quickly upgrade return on investment, possible joint ventures with other concerns. Eventually, Myrick foresees evolvement of a commercial development "philosophy" for the company. The group also may try operation research methods on development problems.

Net effect of Davison's switch: a sharp increase in long-range planning. But perhaps just as important is "uniform analysis." Concentration of planning in one department will avoid use of different yardsticks for different projects.

**Monsanto:** Better coordination and closer control of new-products development and forward planning activities are behind reorganization at Monsanto's Plastics Division. Prior to establishment of the new unit, development was carried on separately by line departments (including sales, research, engineering).

The new group has four major responsibilities:

- To coordinate introduction of new processes, products and raw materials, and to serve as a central point for accumulating and screening ideas.
- To assist general management in negotiating joint development projects with other companies, new investments, buying and selling know-how.
- To provide liaison with other Monsanto operations.
- To coordinate long-range planning.

At Springfield, Mass., Development Director David Plumb reports to the general manager, is assisted by five specialists. An assistant development director (with three specialists) works out of Texas City and is responsible to Plumb. The department will have line responsibility for screening and evaluating new products and handling intercompany negotiations. But it will not assume line responsibility for pilot-plant production, laboratory work or detailed engineering.

If ideas survive screening, they receive a more detailed evaluation, are passed on to the division's general manager. Final decision on whether to proceed is made by the division's general management.

**Union Carbide Chemicals:** Consolidation of Union Carbide Chemicals' sales and sales development functions into a marketing organization is aimed at preventing future problems between sales and development departments. The company expects new products to account for much of the hoped-for doubling of sales volume in the next decade. But new items often compete with products already in the company catalog. When introducing isodecanol, for example, Carbide found it bucking its own well-established 2-ethylhexanol. Result: intradepartmental competition, marketing effort duplication, difficulty in promoting both compounds.

The change-over produced a new five-man marketing committee whose members report to Vice-President John Field. The committee will integrate five broad functions: marketing services (market research, market development, application research, etc.); new chemical marketing; product marketing (including budgeting, forecasting, and sales analysis); industry sales (field management); and sales relations (customer liaison, advertising, sales hiring and training).

The committee will increase the efficiency of all marketing functions and will provide more effective means of integrating the company's sales staff activities.

**Diamond Alkali:** Unlike many other recent changes that center about new products, Diamond's revisions will intensify market research and evaluation of established and closely related products. The newly expanded (from two members to eight) market research group will centralize market research. Formerly, it was handled by operating divisions.

The new unit will handle divisional projects and special assignments from the sales vice-president. Market research will concentrate on establishing regional sales potential and measuring the company's performance in the various regions.

The latest revisions in commercial chemical development structures are neither the first nor, in all probability, the last. Since new products are the lifeblood of industry, more and more chemical companies will be strengthening long-term planning.

## DATA DIGEST

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- **Rubber antiozonants:** Leaflet describes how substituted *p*-phenylenediamines, Eastozone's 30, 31 and 32, protect rubber from ozone deterioration. Performance characteristics and physical property data are included. Eastman Chemical Products, Inc. (New York).
- **Textile chemicals:** New brochure describes use of company products. Chemicals are classified by end-use function in textile processing. Booklet includes detailed charts and conversion tables. Union Carbide Chemicals Co. (New York).
- **Tin:** Winter issue of "Tin and Its Uses" outlines new developments in plating, alloy bearings, organotin compound analysis, application of tributyltin compounds, canning uses and other areas. Tin Research Institute (Greenford, England).
- **Paint emulsions:** Kit contains more than 30 bulletins and data sheets describing uses of resin emulsions in paint formulation. Colton Chemical Co. (Cleveland).
- **Phenolic products:** 12-page catalog lists company's phenolic resins, varnishes and molding powders, gives technical data and outlines various applications. Chemical Materials Dept., General Electric Co. (Pittsfield, Mass.).
- **Polyethylene tanks:** Catalog delineates cylindrical, self-supporting, 25- and 55-gal. tanks, rectangular tanks and examples of custom-designed containers. American Agile Corp. (Maple Heights, O.).
- **Safety:** Leaflet shows how company products contribute to safety factors in end-use applications. Grasselli Chemicals Dept., Du Pont (Wilmington).
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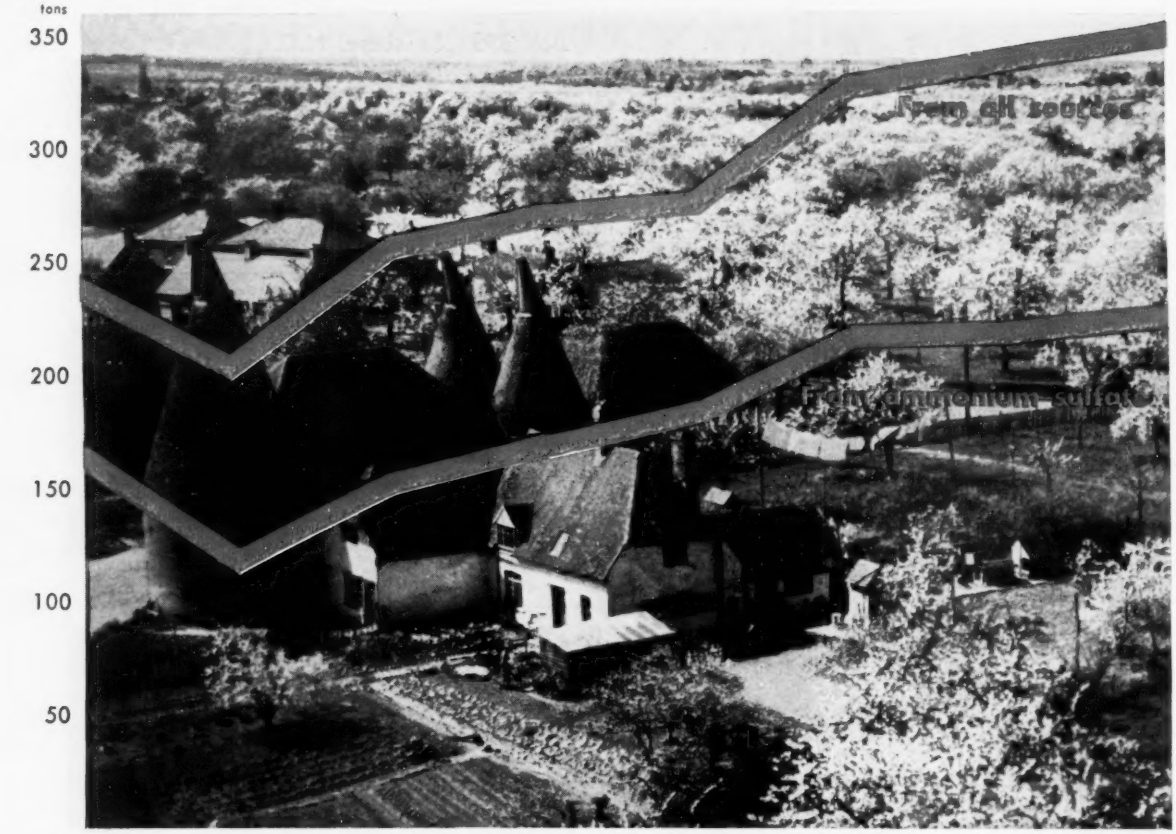
## Fertilizer Nitrogen Consumption in Great Britain




Source: British Sulfate of Ammonia Federation, Ltd.

# Ammonium Sulfate: Tops for U.K. Nitrogen

**In contrast with ammonium sulfate's** declining importance in U.S. fertilizer manufacture (*CW, Feb. 1, p. 65*), it provides fertilizer makers in Great Britain with nearly 65% of their total nitrogen needs.

At the end of the 1957-58 fertilizer year, the British agricultural industry will have consumed an estimated 350,000 tons of nitrogen; some 225,000 tons will come from ammonium sulfate. This is a 75% jump in usage of nitrogen derived from ammonium sulfate, compared with 1950-51.

Why has ammonium sulfate maintained its dominant position abroad? Mixed fertilizers, its prime users, are still favored in England over other types, such as soluble fertilizers. And for these mixed materials, ammonium sulfate hasn't faced strong competition from ammoniation of superphosphates, as it has in the U.S.

Meanwhile, world nitrogen production in 1956-57 hit a new high of some 10.2 million tons. Sulfate of ammonia, by far the largest contributor, supplied nearly one-third of the nitrogen—some 3 million tons.

More and more manufacturers are considering this question today, as the use of oxygen in industry continues to expand.

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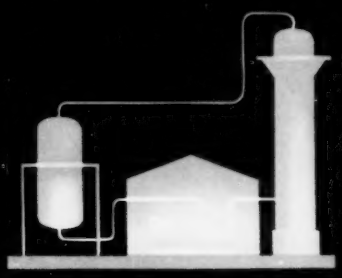

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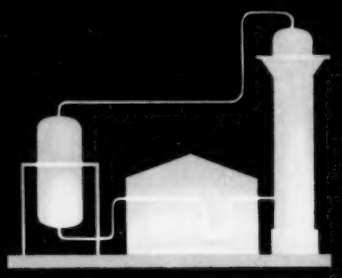
Nitrogen Division
Orange, Texas



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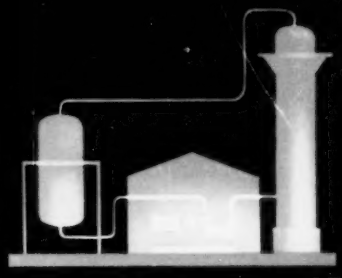
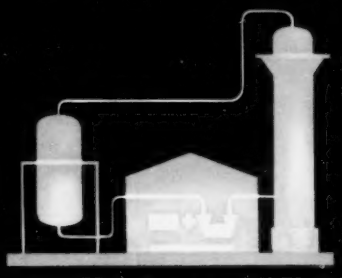
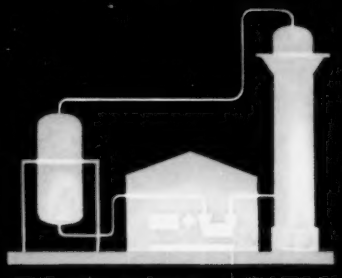
Lavera, France
(Original plant plus two expansions)



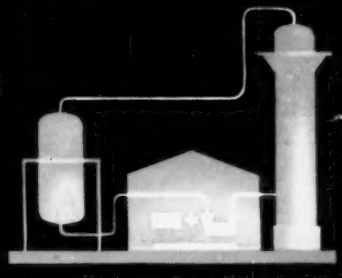
**General Aniline & Film Corporation**
Linden, New Jersey



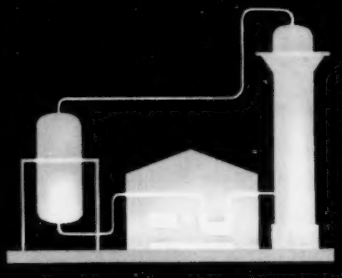
**Jefferson Chemical Company**
Port Neches, Texas



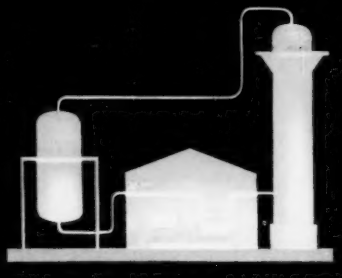
**Societe Chimique des Derives du Petrole**
Antwerp, Belgium



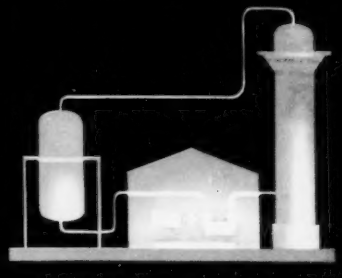
**Mitsui Petrochemical Industries, Ltd.**
Iwakuni City, Japan



**Farbenfabriken Bayer**
Dormagen, Germany



**Marles-Kuhlmann**
LeHavre, France



**Chemische Fabrik Holten**
Oberhausen-Holten, Germany

## Scientific Design Company, Inc.

COMPLETE PLANT DESIGN AND CONSTRUCTION
SERVING THE PROCESS INDUSTRIES

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